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=> file casreact
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FILE CONTENT:1840 - 13 Sep 2009 VOL 151 ISS 12

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=> d que
L1                STR
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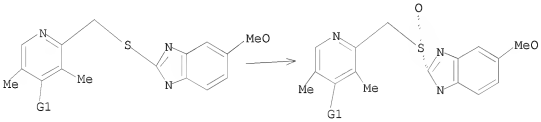


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G1 O,N,X,NO2


Structure attributes must be viewed using STN Express query preparation.
L3            82 SEA FILE=CASREACT SSS FUL L1 (   233 REACTIONS)
L4            19 SEA FILE=CASREACT L3 AND TITANIUM


=> d l4 1-19 ibib abs fcrd


L4   ANSWER 1 OF 19  CASREACT  COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER:         151:8499  CASREACT
TITLE:                    Process for preparation of chiral sulfoxide
                          derivatives by stereoselective oxidation
INVENTOR(S):              Sun, Tianjiang; Lu, Hongguo; Zhou, Bin; Zhang,
                          Zhenggen; Meng, Ting; Liu, Xin; Zhu, Ailin; He, Huili;
```

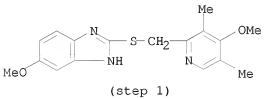
Cai, Zhan; Yang, Yushe
PATENT ASSIGNEE(S): Yangtze River Pharmaceutical Group, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 9pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 101429192	A	20090513	CN 2008-10195705	20080822

PRIORITY APPLN. INFO.: CN 2008-10195705 20080822

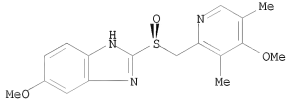
AB This invention provides a process for the preparation of chiral sulfoxide derivs. comprising stereoselective oxidation of the corresponding thioethers in the presence of chiral titanium complex catalyst. For example, 5-(difluoromethoxy)-2-[[(3,4-dimethoxy-2-pyridinyl)methyl]thio]-1H-benzimidazole was oxidized with diisopropylbenzene hydroperoxide in toluene in the presence of di-Et D-tartrate and tetraisopropyl titanate to give (S)-Pantoprazole with 99.2% purity and >99% e.e. (70.0%). The process has the advantages of high yield, few byproducts, and high product purity.

RX(3) OF 6



(step 1)

1. Di-Et D-Tartrate, Ti(OPr-i)4, Water, PhMe
2. R:26762-93-6, EtN(Pr-i)2
3. NaOH, Water
4. MeOH
5. AcOH



64%

NOTE: stereoselective
CON: STAGE(1) 1 hour, 60 - 65 deg C
STAGE(2) 3 hours, 0 - 5 deg C; 20 hours, 0 - 5 deg C
STAGE(4) 0.5 hours
STAGE(5) pH 7.5 - 8

L4 ANSWER 2 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 150:374385 CASREACT
TITLE: Process for the preparation of substituted sulfoxide
AUTHOR(S): Anon.
CORPORATE SOURCE: USA
SOURCE: IP.com Journal (2008), 8(3B), 16 (No. IPCOM000168467D), 11 Mar 2008

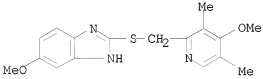
CODEN: IJPOBX; ISSN: 1533-0001
PUBLISHER: IP.com, Inc.
DOCUMENT TYPE: Journal; Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
IP 168467D		20080311	IP 2008-168467D	20080311

PRIORITY APPLN. INFO.: IP 2008-168467D 20080311

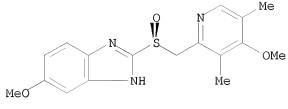
AB Enantiomerically enriched sulfoxides like omeprazole, pantoprazole, rabeprazole and lansoprazole, which are proton pump inhibitors useful in the treatment of ulcers, can be prepared by oxidizing their corresponding sulfides. An enantioselective catalytic oxidation process for the preparation of an optically active enantiomer or an enantiomerically enriched form of substituted pyridinylmethyl sulfinyl-benzimidazoles has been developed.

RX(1) OF 1



(step 1)

1. Di-Et D-Tartrate, Ti(OPr-i)4, CS2
2. Cumene hydroperoxide
3. KOH, Water
4. Ba(OH)2, MeOH



1/2 Ba

NOTE: stereoselective, alternative reaction conditions shown
CON: STAGE(1) 25 - 30 deg C; 90 minutes, 45 - 50 deg C
STAGE(2) 45 - 50 minutes, 25 - 35 deg C; 2 hours, 30 - 35 deg C
STAGE(3) 30 - 45 minutes, 30 - 35 deg C
STAGE(4) 12 hours, 25 - 30 deg C

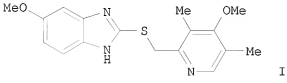
L4 ANSWER 3 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 149:556627 CASREACT
TITLE: Process for preparation of esomeprazole by enantioselective oxidation of the corresponding sulfide with peroxides in presence of chiral titanium catalyst
INVENTOR(S): Khomenko, T. M.; Volcho, K. P.; Salakhutdinov, N. F.; Tolstikov, G. A.
PATENT ASSIGNEE(S): Novosibirskii Institut Organicheskoi Khimii im. N. N. Vorozhtsova SO RAN, Russia

SOURCE: Russ., 4pp.
CODEN: RUXXE7
DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2339631	C1	20081127	RU 2007-113738	20070412

PRIORITY APPLN. INFO.: RU 2007-113738 20070412

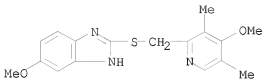
GI



I

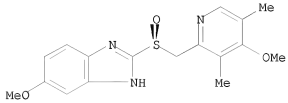
AB Esomeprazole (I) and/or its salts, useful as an anti-ulcer agent (no data), is prepared by enantioselective oxidation with organic peroxides of the corresponding sulfide, 5-methoxy-2-[(4-methoxy-3,5-dimethylpyridin-2-yl)methylthio]-1H-benzo[d]imidazole, in an organic solvent in presence of a catalytic complex of titanium(IV) which has two chiral ligands: a chiral diol (preferably D-diethyl tartrate) and a chiral amine (preferably N,N-dimethyl-(R)-1-phenylethylamine). E.g., treating 1.66 mmol omeprazole sulfide in 2.5 mL PhMe with 9 μL H2O, 1.16 mmol di-Et D-tartrate and 0.77 mmol Ti(OPr-iso)4, at 55° and stirring 1 h, then cooling to 30° and adding 0.81 mmol N,N-dimethyl-(R)-1-phenylethylamine and stirring 15 min, then adding 1.58 mmol cumene hydroperoxide as an 86.5% solution in cumene and stirring 4.5 h at 30° gave, after workup, a mixture containing 82.3% of the desired sulfide, which upon treatment with NaOH in H2O/MeCN gave a 64% overall yield of esomeprazole sodium.

RX(1) OF 2



(step 1)

1. Di-Et D-Tartrate, Ti(OPr-i)4, Water, PhMe
2. (R)-PhCHMeNMe2
3. Cumene hydroperoxide, S:98-82-8
4. NaOH, Water, MeCN



Na

64%

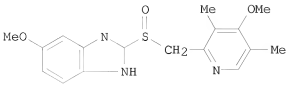
NOTE: stereoselective, yields lower if reaction run at 35.degree. or 25.degree.

CON: STAGE(1) 55 deg C; 1 hour, 55 deg C; 55 deg C -> 30 deg C
STAGE(2) 30 deg C; 15 minutes, 30 deg C
STAGE(3) 30 deg C; 4.5 hours, 30 deg C
STAGE(4) room temperature; 1 hour, room temperature

L4 ANSWER 4 OF 19 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER:	149:556518 CASREACT
TITLE:	An efficient procedure for the synthesis of Esomeprazole using a titanium complex with two chiral ligands
AUTHOR(S):	Khomenko, T. M.; Volcho, K. P.; Komarova, N. I.; Salakhutdinov, N. F.
CORPORATE SOURCE:	Vorozhtsov Novosibirsk Institute of Organic Chemistry, Siberian Division, Russian Academy of Sciences, Novosibirsk, 630090, Russia
SOURCE:	Russian Journal of Organic Chemistry (2008), 44(1), 124-127 CODEN: RJOCEQ; ISSN: 1070-4280
PUBLISHER:	Pleiades Publishing, Ltd.
DOCUMENT TYPE:	Journal
LANGUAGE:	English

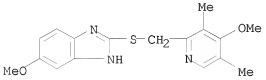
GI



I

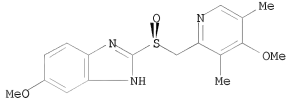
AB A procedure has been proposed for the selective preparation of Esomeprazole [(S)-I] via asym. oxidation of the corresponding prochiral sulfide in the presence of a catalytic complex derived from titanium(IV) isopropoxide and two different chiral ligands, di-Et D-tartrate and (R)-N,N-dimethyl-1-phenylethanamine.

RX(1) OF 2



(step 1)

1. Ti(OPr-i)4, Di-Et D-Tartrate, Water, PhMe
2. (R)-PhCHMeNMe2
3. Cumene hydroperoxide, S:98-82-8
4. NaOH, Water, MeCN



Na

57%

NOTE: stereoselective
CON: STAGE(1) room temperature -> 55 deg C; 1 hour, 55 deg C; 55 deg C -> 30 deg C
STAGE(2) 30 deg C; 15 minutes, 30 deg C
STAGE(3) 30 deg C; 4.5 hours, 30 deg C
STAGE(4) room temperature; 1 hour, room temperature

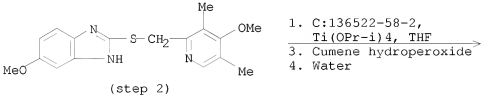
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 5 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 149:555936 CASREACT
TITLE: Synthesis of optically active 2,5-dialkylcyclohexane-1,4-diols and their application in the asymmetric oxidation of sulfides

AUTHOR(S): Sun, Jiangtao; Yang, Minghua; Dai, Zhenya; Zhu, Chengjian; Hu, Hongwen
CORPORATE SOURCE: Department of Chemistry, Nanjing University, Nanjing, 210093, Peop. Rep. China
SOURCE: Synthesis (2008), (16), 2513-2518
CODEN: SYNTBF; ISSN: 0039-7881
PUBLISHER: Georg Thieme Verlag
DOCUMENT TYPE: Journal
LANGUAGE: English

AB A simple and efficient approach to obtain optically pure 1,4-diols was established. The asym. oxidation of sulfides to sulfoxides with cumyl hydroperoxide in moderate yields and moderate to high enantioselectivities (≤84%) catalyzed by chiral Ti/1,4-diols complexes was achieved. An ee of 76% was obtained in the asym. synthesis of esomeprazole.

RX(23) OF 27



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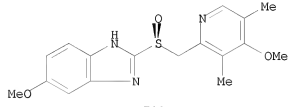

72%

NOTE: molecular sieves used, stereoselective
CON: STAGE(1) 2 hours, room temperature; room temperature -> 0 deg C
STAGE(2) 30 minutes, 0 deg C
STAGE(3) 36 hours, 0 deg C
STAGE(4) 0 deg C

REFERENCE COUNT: 80 THERE ARE 80 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 6 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 149:315505 CASREACT
TITLE: Process for the preparation of esomeprazole magnesium dihydrate and its use for treatment of dyspepsia, peptic ulcer disease, gastroesophageal reflux disease, or Zollinger-Ellison syndrome
INVENTOR(S): Rao, Dharmaraj Ramachandra; Kankan, Rajendra Narayanrao; Pathi, Srinivas Laxminarayan; Bangalore, Gopalakrishna Sumana
PATENT ASSIGNEE(S): Cipla Limited, India; Curtis, Philip Anthony
SOURCE: PCT Int. Appl., 36pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008102145	A2	20080828	WO 2008-GB602	20080221
WO 2008102145	A3	20081113		

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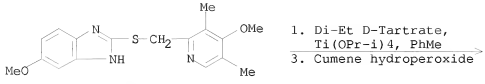
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA

PRIORITY APPLN. INFO.: IN 2007-MU348 20070221

AB A process for preparing Form A of (S)-5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)- methyl]sulfinyl]-1 H-benzimidazole magnesium dihydrate, processes for preparing various intermediates useful in the preparation of Form A of (S)-5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)-methyl]sulfinyl]-1 H-benzimidazole magnesium dihydrate and a novel polymorphic Form II of 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)-methyl]thio]-1 H-benzimidazole. Thus, esomeprazole magnesium dihydrate form A was prepared: methanol (50 mL), potassium salt of esomeprazole (35 g) were charged; methanolic magnesium chloride hexahydrate solution (8.1 g of magnesium chloride hexahydrate dissolved in 40 mL of methanol) was added over a period of 1 h; water (80 mL) and Et acetate (185 mL) mixture was added, washed with Et acetate (50 mL) and dried at 60-65°C under vacuum to yield the titled compound (21.1 g, 62% yield, water content of 5.7%).

RX(3) OF 9



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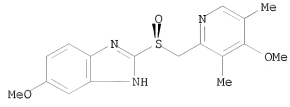


K

57%

NOTE: alternative preparation shown
CON: STAGE(1) 15 minutes, room temperature; 30 minutes, 25 - 30 deg C
STAGE(2) 1 hour, 70 deg C; 0.5 hours, 70 - 75 deg C;
75 deg C -> 15 deg C
STAGE(3) 3 hours, 10 - 15 deg C

L4 ANSWER 7 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 148:355792 CASREACT
TITLE: Preparation of unsym. heterocyclylsulfoxide derivatives for treating gastrointestinal disorders
INVENTOR(S): Larsson, Magnus Erik; Stenhede, Urban Jan; Sorensen, Henrik; Von Unge, Sverker Per Oskar; Cotton, Hanna Kristina
PATENT ASSIGNEE(S): Astra Aktiebolag, Swed.
SOURCE: U.S., 21pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5948789	A	19990907	US 1995-492087	19950714
SE 9402510	A	19960116	SE 1994-2510	19940715
SE 504459	C2	19970217		
WO 9602535	A1	19960201	WO 1995-SE818	19950703

W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG

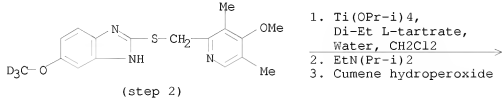
PRIORITY APPLN. INFO.: SE 1994-2510 19940715

WO 1995-SE818 19950703

OTHER SOURCE(S): MARPAT 148:355792

AB Enantiomeric R1ZSOR2 (I) [R1 = (un)substituted 2-pyridyl, (un)substituted 2-(R4R5N)C6H4; R2 = (un)substituted 2-benzimidazolyl, thieno[3,4-d]imidazol-2-yl, etc.; R4,R5 = H, (ar)alkyl; Z = CH2, (un)substituted 1,2-phenylene, etc.] were prepared by oxidation of prochiral R1ZSR2 in the presence of a chiral Ti complex and a base. I are disclosed for treatment of gastrointestinal disorders (no data).

RX(1) OF 16



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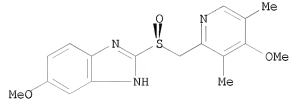

Na

NOTE: optimization study (optimized on solvent, temperature), stereoselective (99.8% ee)
CON: STAGE(1) 20 minutes, room temperature
STAGE(2) room temperature -> -20 deg C
STAGE(3) 66 hours, 2 deg C

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 8 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 148:262584 CASREACT
TITLE: Process for preparation of chiral sulfoxide compounds via asymmetrical oxidation
INVENTOR(S): Singh, Anand; Singh, Khushwant; Dubey, Sushil Kumar
PATENT ASSIGNEE(S): Jubilant Organosys Limited, India
SOURCE: PCT Int. Appl., 22pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008018091	A1	20080214	WO 2007-IN335	20070808

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GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG,
KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL,
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IN 2006DE01796 A 20080606 IN 2006-DE1796 20060808
CA 2660112 A1 20080214 CA 2007-2660112 20070808
EP 2054403 A1 20090506 EP 2007-805639 20070808
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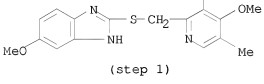
AL, BA, HR, MK, RS

PRIORITY APPLN. INFO.: IN 2006-DE1796 20060808
WO 2007-IN335 20070808

OTHER SOURCE(S): MARPAT 148:262584

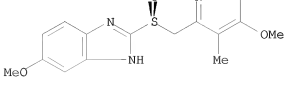
AB This invention pertains to a process for the preparation of sulfoxide compound, in particular, substituted 2-(2-pyridinylmethylsulfinyl)-1H-benzimidazoles, by asym. oxidizing prochiral sulfide substrates with an effective amount of oxidizing agent in the presence of a chiral transition metal complex without using an organic solvent and base. For example, 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole was oxidized with cumene hydroperoxide in presence of titanium isopropoxide and L- (-)-di-Et tartrate, and the sulfoxide product was treated with methanolic potassium hydroxide to give (S)-5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole potassium salt. Advantageously, the process is economically viable and eco-friendly for the preparation of sulfoxides either as a single enantiomer or in an enantiomerically enriched form, which avoids the use of organic solvent and base, and the product is free from sulfone byproduct.

RX(1) OF 1



1. Ti(OPr-i)4, Di-Et L-tartrate
2. Water
3. Cumene hydroperoxide
4. KOH, MeOH

(step 1)



K

CON: STAGE(1) room temperature -> 60 deg C; 30 minutes, 55 - 60 deg C
STAGE(2) 1 hour; 5 - 10 deg C
STAGE(3) 3 - 4 hours, 5 - 10 deg C
STAGE(4) 10 - 15 deg C; 30 minutes

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

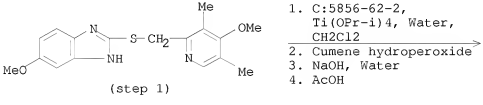
L4 ANSWER 9 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 147:322979 CASREACT
TITLE: Method for preparing chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole and S-tenatoprazole
INVENTOR(S): Wang, Qinghe; Cheng, Maosheng
PATENT ASSIGNEE(S): Shenyang Pharmaceutical University, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 6pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 101012141	A	20070808	CN 2007-10010273	20070202

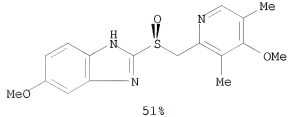
PRIORITY APPLN. INFO.: CN 2007-10010273 20070202

AB The invention provides a method for the preparation of chiral sulfoxides, which comprises oxidizing the corresponding sulfides with peroxides in the presence of titanium or zirconium tetraalkoxides and chiral β-amino alcs. The method was successfully applied to the synthesis of S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, and S-tenatoprazole, which are useful as proton pump inhibitors.

RX(1) OF 5



(step 1)



51%

CON: STAGE(1) room temperature; 2 hours, room temperature -> reflux
STAGE(2) -10 deg C; 6 hours, -10 - 0 deg C
STAGE(3) 6 hours, -10 - 0 deg C
STAGE(4) pH 8 - 9

L4 ANSWER 10 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 147:257772 CASREACT

TITLE: Process for preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents.

INVENTOR(S): Dubey, Sushil Kumar; Vig, Gaurav; Singh, Anand; Tripathi, Sushil; Paul, Soumendu

PATENT ASSIGNEE(S): Jubilant Organosys Limited, India

SOURCE: PCT Int. Appl., 21pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007088559	A1	20070809	WO 2007-IN35	20070131

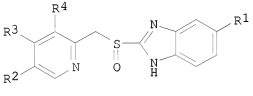
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: IN 2006-DE271 20060201

OTHER SOURCE(S): MARPAT 147:257772

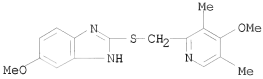
GI



I

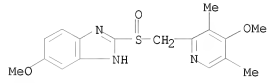
AB Title compds. (I; R1-R4 = H, alkyl, alkoxy, aryl, aryloxy), were prepared by treatment of the corresponding prochiral sulfides with chiral transition metal complexes and oxidizing agents optionally in presence of an organic solvent, wherein the chiral ligands comprise dicyclohexylidene, diacetonide, or benzylidene derivs. of sugars. Thus, vanadium oxytripropoxide and 1,2,4,5-Di-O-cyclohexylidene-D-fructofuranose were stirred together for 10-15 min in PhMe; 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole and H2O were added and the mixture was heated at 50-55° for 1 h; the mixture was cooled to 25-30° followed by addition of diisopropylethylamine and cumene hydroperoxide over 1 h followed by stirring for 45 min. and workup to give 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole, sodium salt in 75% enantiomeric excess.

RX(1) OF 1



(step 2)

1. R:945614-29-9, R:1686-23-3, PhMe
3. Water
4. Cumene hydroperoxide, EtN(Pr-i)2



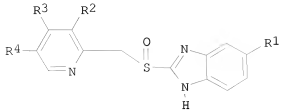
NOTE: alternative preparation shown, stereoselective
CON: STAGE(1) 10 - 15 minutes, room temperature
STAGE(2) room temperature -> 55 deg C
STAGE(3) 1 hour, 50 - 55 deg C; 55 deg C -> 30 deg C
STAGE(4) 1 hour, 25 - 30 deg C; 45 minutes, 25 - 30 deg C

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 11 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 147:235177 CASREACT
TITLE: Process for preparation of alkali metal or alkaline earth metal salts of an optically active substituted pyridinylmethyl-sulfinyl-benzimidazole
INVENTOR(S): Muljibhai, Patel Vijay; Ravikant, Soni Rohit; Budhdev, Rehani Rajeev; Rajamannar, Thennati
PATENT ASSIGNEE(S): Sun Pharmaceutical Industries Ltd., India
SOURCE: Indian Pat. Appl., 16pp.
CODEN: INXXBQ
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
IN 2003MU00503	A	20050211	IN 2003-MU503	20030519

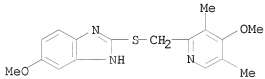
PRIORITY APPLN. INFO.: IN 2003-MU503 20030519
OTHER SOURCE(S): MARPAT 147:235177
GI



I

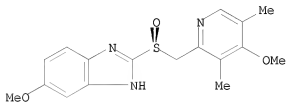
AB A process for the preparation of alkali metal or alkaline earth metal salts of an optically active enantiomer or an enantiomerically enriched form of substituted pyridinylmethyl-sulfinyl-benzimidazole. The said process comprises enantioselective catalytic oxidation of a substituted pyridinylmethyl prochiral sulfide derivative of benzimidazole, with an oxidizing agent in an organic solvent in the presence of a base and a catalyst comprising titanium or vanadium complexed with a chiral monodentate ligand to obtain the compound I (R1-R4 = H, linear or branched C1-4 alkyl, alkoxy, aryl, aryloxy, etc.), thereafter treating the compound I with an alkali or alkaline earth metal source.

RX(1) OF 3



(step 1)

1. C:21210-43-5, Ti(OPr-i)4, EtN(Pr-i)2, Cumene hydroperoxide, PhMe
2. NaOH, Water



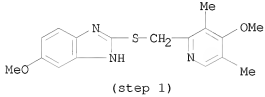
Na

NOTE: catalyst prepd. in situ
CON: STAGE(1) 17 hours, 40 deg C; 10 - 15 minutes, 25 - 30 deg C;
2 hours, 25 - 30 deg C
STAGE(2) 15 minutes, room temperature

L4 ANSWER 12 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 147:189098 CASREACT
TITLE: Factors influencing the selectivity in asymmetric oxidation of sulfides attached to nitrogen containing heterocycles
AUTHOR(S): Seenivasaperumal, Muthu; Federsel, Hans-Juergen;

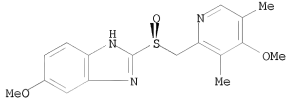
Ertan, Anne; Szabo, Kalman J.
CORPORATE SOURCE: Arrhenius Laboratory, Department of Organic Chemistry, Stockholm University, Swed.
SOURCE: Chemical Communications (Cambridge, United Kingdom) (2007), (21), 2187-2189
CODEN: CHCOFS; ISSN: 1359-7345
PUBLISHER: Royal Society of Chemistry
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Asym. oxidation of heterocyclic sulfides, including imidazole, benzimidazole, indole, and pyrimidine derivs., was studied by using a tartrate/Ti(iOPr)4 catalyst system. Substituents on the carbon atoms of the imidazole ring and sterically similar substituents on the sulfur were found not to influence the high enantioselectivity of the sulfoxidn. Me substitution on one of the imidazole nitrogens leads to formation of a racemic product.

RX(1) OF 11



(step 1)

1. Di-Et D-Tartrate, Water, PhMe
2. Ti(OPr-i)4
3. Cumene hydroperoxide, EtN(Pr-i)2
4. Water



78%

NOTE: ee 99%, stereoselective
CON: STAGE(1) 15 minutes, 50 deg C
STAGE(2) 45 minutes, 50 deg C
STAGE(3) 2 hours, 35 deg C

REFERENCE COUNT: 48 THERE ARE 48 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 13 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 145:438615 CASREACT
TITLE: Enantioselective production of benzimidazole derivatives and their salts
INVENTOR(S): Jiang, Biao; Zhao, Xiao-Long; Dong, Jia-Jia; Wang, Wan-Jun
PATENT ASSIGNEE(S): Ratiopharm GmbH, Germany
SOURCE: Ger., 16pp.
CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

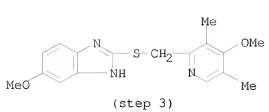
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102005061720	B3	20061019	DE 2005-102005061720	20051222
CA 2634138	A1	20070719	CA 2006-2634138	20060419
WO 2007079784	A1	20070719	WO 2006-EP3587	20060419
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
EP 1966188	A1	20080910	EP 2006-742610	20060419
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR				
IN 2008DN04677	A	20080815	IN 2008-DN4677	20080530
CN 101341144	A	20090107	CN 2006-80048005	20080619
US 20080319195	A1	20081225	US 2008-158450	20080620
PRIORITY APPLN. INFO.:			DE 2005-102005061720	20051222
			WO 2006-EP3587	20060419

OTHER SOURCE(S): MARPAT 145:438615
GI

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

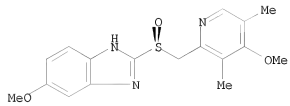
AB The invention concerns a new procedure for the production of benzimidazole derivs. I with a chiral sulfoxide group in enantiomerically pure form or in a form, in which one of the two enantiomers is enriched opposite the other enantiomer. The invention concerns likewise a procedure for the production of the salts of the individual enantiomers of the benzimidazole derivs. with a chiral sulfoxide group. In particular the invention concerns a procedure for the production of the S-enantiomer of omeprazol (also known as esomeprazol) and the salts of it, in particular the zinc salt of the S-enantiomer of the omeprazol. The procedure comprises: (a) mix (R,R)- or (S,S)-1,2-bisarylethane-1,2-diols with titanium alkoxide in an organic solvent; (b) add water; (c) add a prochiral sulfide II; (d) add an oxidizing agent; (e) add aqueous ammonia; (f) add an acid; (g) extract with an organic solvent; (h) cool the organic solution and filter; and (i) optionally prepare the zinc salts of I. Thus, (S)-omeprazol (III) was prepared in 94 % yield and >99% enantiomeric excess from 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole (IV) via S-oxidation with Me3COOH in aqueous PhMe containing Ti(OCHMe2)4 and (R,R)-1,2-bis(2-bromophenyl)ethane-1,2-diol.

RX(1) OF 5



(step 3)

1. Ti(OPr-i)4, C:128574-71-0, PhMe
2. Water
4. t-BuOOH
5. NH4OH, Water
6. AcOH
7. i-BuCOMe



90%

NOTE: stereoselective (94% e.e.)
CON: STAGE(1) 10 minutes, 25 deg C
STAGE(2) 10 minutes, 25 deg C
STAGE(3) 25 deg C; 25 deg C -> -20 deg C
STAGE(4) 12 hours, -20 deg C
STAGE(5) -20 deg C -> room temperature
STAGE(6) room temperature; room temperature -> -10 deg C
STAGE(7) overnight, -10 deg C

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

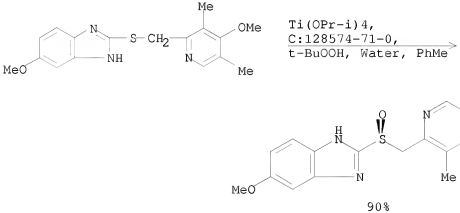
L4 ANSWER 14 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 145:249204 CASREACT
TITLE: Process for preparation of (S)-omeprazole by enantioselective oxidation
INVENTOR(S): Jiang, Biao; Zhao, Xiaolong; Wang, Wanjun; Dong, Jiajia; Xu, Xiangya
PATENT ASSIGNEE(S): Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 13pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1810803	A	20060802	CN 2006-10023955	20060217

PRIORITY APPLN. INFO.: CN 2006-10023955 20060217
OTHER SOURCE(S): MARPAT 145:249204
AB The title method includes oxidizing 5-methoxy-2-(4-methoxy-3,5-dimethylpyridin-2-ylmethylthio)-1H-benzimidazole with oxidant in the presence of chiral bidentate ligand (R,R)/(S,S)-1,2-diaryl-ethylene glycol and titanium

tetraalkoxide at a molar ratio of 1:(0.5-3):(0.02-0.4):(0.01-0.2) at -78°C to 50°C for 1-24 h; quenching reaction with basic aqueous solution and purifying to obtain neutral free base (S)-omeprazole solid with ee of 92-99%; wherein the chiral bidentate ligand and the titanium tetraalkoxide in-situ form a complex catalyst in the reaction; and the oxidant is a peroxide compound This invention has the advantages of no requirement for costly cumenyl hydroperoxide and diisopropylethylamine, and high yield.

RX(1) OF 2



90%

NOTE: stereoselective, ee 94%, optimization study, optimized on solvent, stoichiometry, reagent, temperature, catalyst
CON: STAGE(1) room temperature -> -20 deg C; 12 hours, -20 deg C

L4 ANSWER 15 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 144:390922 CASREACT
TITLE: Stereoselective oxidation processes for the preparation of chiral substituted sulfoxides from the racemic sulfides
INVENTOR(S): Kumar, Neela Praveen; Khanna, Mahavir Singh; Prasad, Mohan; Kumar, Yatendra
PATENT ASSIGNEE(S): Ranbaxy Laboratories Limited, India
SOURCE: PCT Int. Appl., 23 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006040635	A1	20060420	WO 2005-IB2946	20051004

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE,

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KG, KZ, MD, RU, TJ, TM
EP 1802584 A1 20070704 EP 2005-790107 20051004
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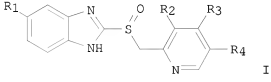
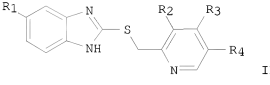
IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR
IN 2007DN03340 A 20070831 IN 2007-DN3340 20070503
US 20080275245 A1 20081106 US 2008-576867 20080220
PRIORITY APPLN. INFO.: IN 2004-DE1957 20041011
WO 2005-IB2946 20051004
OTHER SOURCE(S): MARPAT 144:390922
GI



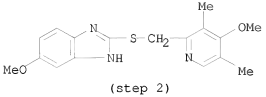
I



II

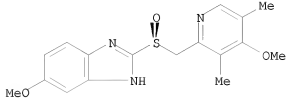
AB An enantioselective catalytic oxidation process for the preparation of an optically active enantiomer or an enantiomerically enriched form of a substituted pyridinylmethylsulfinylbenzimidazole [I; R1-R4 = H, C1-4 (un)branched alkyl, C1-4 (un)branched alkoxy, aryl, aryloxy], or its pharmaceutically acceptable salts (e.g., esomeprazole potassium), comprises oxidizing a prochiral sulfide (II; e.g., omeprazole sulfide) in the presence of a chiral transition metal complex [e.g., titanium isopropoxide and L-(+)-diethyl tartrate] and a base (e.g., diisopropylethylamine) in the absence of an organic solvent with an oxidant (e.g., cumene hydroperoxide) followed by an optional salification (e.g., potassium hydroxide).

RX(1) OF 3



(step 2)

1. Ti(OPr-i)4, Di-Et L-tartrate
2. Cumene hydroperoxide, Di-Et L-tartrate, EtN(Pr-i)2
3. KOH, MeOH



K

NOTE: optimization study, stereoselective
CON: STAGE(1) room temperature -> 50 deg C; 1.5 hours; 25 - 30 deg C
STAGE(2) 25 - 30 deg C; 3 hours, 25 - 30 deg C
STAGE(3) 25 - 35 deg C; 15 - 16 hours, 25 - 35 deg C

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

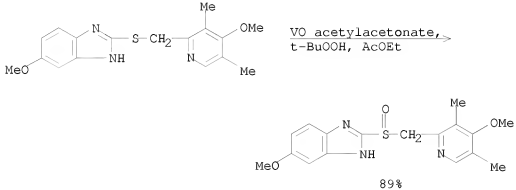
L4 ANSWER 16 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 140:357338 CASREACT
TITLE: Preparation of sulfinyl-containing drugs by catalytic oxidation of thioether compounds
INVENTOR(S): Yang, Guangzhong
PATENT ASSIGNEE(S): Institute of Pharmacy, Chinese Academy of Medical Sciences, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 12 pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1381443	A	20021127	CN 2001-109783	20010420
CN 1215056	C	20050817		
PRIORITY APPLN. INFO.:			CN 2001-109783	20010420

AB The thioether compds., such as 5-methoxy-2-(3,5-dimethyl-4-methoxy-2-pyridylmethylthio)-1H-benzimidazole, 2-[3-methyl-4--2-pyridylmethylthio]-1H-benzimidazole, 5-difluoromethoxy-2-(3,4-dimethoxy-2-pyridylmethylthio)-1H-benzimidazole, 2-[4-(3-methoxypropoxy)-3-methyl-2-pyridylmethylthio]-1H-benzimidazole, or (diphenylmethyl)thioacetamide, were oxidized to sulfoxide by using tert-Bu hydroperoxide (tert-Bu hypochlorite, NaClO, H2O2, perbenzoic acid, or 3-chloroperbenzoic acid) in nonprotic solvent (such as dichloromethane, chloroform, CCl4, acetone, Et acetate, etc) in the presence of catalyst

(0.5-10%) at 0-25°. The catalyst is titanium tetraisopropoxide, bis(pentane-2,4-dionato)vanadium oxide, bis(pentane-2,4-dionato)copper(II), bis(pentane-2,4-dionato)cobalt(II), tris(pentane-2,4-dionato)iron(III), bis(pentane-2,4-dionato)manganese(II), or tris(pentane-2,4-dionato)chromium(III).

RX(5) OF 8



89%

CON: 30 minutes, room temperature

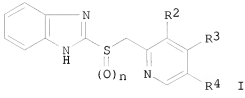
L4 ANSWER 17 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 139:350735 CASREACT
TITLE: Preparation of optically active substituted pyridinylmethylsulfinylbenzimidazoles and salts
INVENTOR(S): Thennati, Rajamannar; Rehani, Rajeev Budhdev; Soni, Rohit Ravikant; Chhabada, Vijay Chhangamal; Patel, Vijaykumar Muljibhai
PATENT ASSIGNEE(S): Sun Pharmaceutical Industries Limited, India
SOURCE: PCT Int. Appl., 31 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003089408	A2	20031030	WO 2003-IN164	20030421
WO 2003089408	A3	20040205		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
IN 194216	A1	20041002	IN 2002-MU299	20020422
IN 2002MU00365	A	20050304	IN 2002-MU365	20020422
AU 2003262375	A1	20031103	AU 2003-262375	20030421
PRIORITY APPLN. INFO.:			IN 2002-MU299	20020422
			IN 2002-MU365	20020422

WO 2003-IN164 20030421

OTHER SOURCE(S): MARPAT 139:350735

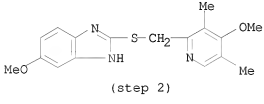
GI



I

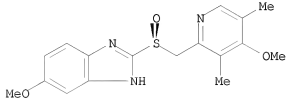
AB Optically active enantiomers of the title compds. I [R1-R4 = H, (un)substituted alkyl, alkoxy, aryl, aryloxy; n = 1] are prepared by stereoselective oxidation of I [n = 0] with an oxidizing agent in an organic solvent in the presence of a base and a catalyst comprising titanium or vanadium complexed with a chiral monodentate ligand. The process yields alkali or alkaline earth metal salts of 5-methoxy-2-[(S)-(4-methoxy-3,5-dimethyl-2-pyridinylmethyl)sulfinyl]-1H-benzimidazole substantially free of sulfone impurity, optionally after purification in a ketone or nitrile solvent. Thus, omeprazole sulfide is oxidized with cumene hydroperoxide in presence of EtN(CHMe2)2, Me (S)-(+)-mandelate, and Ti(OCHMe2)4 in PhMe, followed by washing with MeCN to give esomeprazole sodium with >985 ee.

RX(1) OF 1



(step 2)

1. C:21210-43-5, Ti(OPr-i)4, PhMe
2. EtN(Pr-i)2
3. Cumene hydroperoxide, S:98-82-8



Na

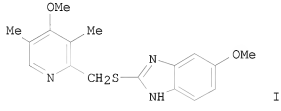
NOTE: stereoselective

CON: STAGE(1) room temperature -> 40 deg C; 17 hours, 40 deg C; 40 deg C -> 30 deg C
STAGE(2) 25 - 30 deg C; 10 - 15 minutes, 25 - 30 deg C
STAGE(3) 25 - 30 deg C; 2 hours, 25 - 30 deg C

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

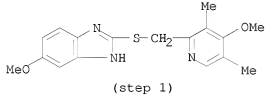
L4 ANSWER 18 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 134:147541 CASREACT
TITLE: Asymmetric synthesis of esomeprazole
AUTHOR(S): Cotton, H.; Elebring, T.; Larsson, M.; Li, L.; Sorensen, H.; von Unge, S.
CORPORATE SOURCE: Process Chemistry, AstraZeneca Process R&D Sodertalje, Soedertaelje, S-151 85, Swed.
SOURCE: Tetrahedron: Asymmetry (2000), 11(18), 3819-3825
CODEN: TASYE3; ISSN: 0957-4166
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
GI



I

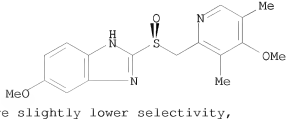
AB A highly efficient synthesis of esomeprazole - the (S)-enantiomer of omeprazole - via asym. oxidation of prochiral sulfide I is described. The asym. oxidation was achieved by titanium-mediated oxidation with cumene hydroperoxide (CHP) in the presence of (S,S)-diethyl tartrate [(S,S)-DET]. The enantioselectivity was provided by preparing the titanium complex in the presence of I at an elevated temperature and/or during a prolonged preparation time and by performing the oxidation of I in the presence of an amine. An enantioselectivity of >94% ee was obtained using this method.

RX(1) OF 2



(step 1)

1. Di-Et D-Tartrate, Ti(OPr-i)4, PhMe, Water
2. EtN(Pr-i)2, Cumene hydroperoxide, S:98-82-8
3. AcOH, Water
4. NaOH, Water



NOTE: alternative prepn. gave slightly lower selectivity, stereoselective

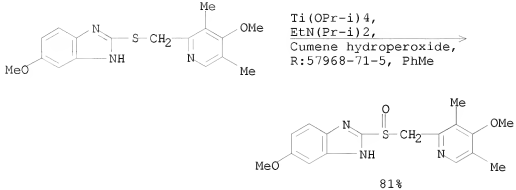
REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 19 OF 19 CASREACT COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 131:5258 CASREACT
TITLE: New process for the synthesis of omeprazole
INVENTOR(S): Cotton, Hanna; Larsson, Magnus; Mattson, Anders
PATENT ASSIGNEE(S): Astra Aktiebolag, Swed.
SOURCE: PCT Int. Appl., 13 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9925711	A1	19990527	WO 1998-SE1984	19981103
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
ZA 9809999	A	19990617	ZA 1998-9999	19981102
IN 190801	A1	20030823	IN 1998-DE3213	19981102
TW 588046	B	20040521	TW 1998-87118172	19981102
CA 2276753	A1	19990527	CA 1998-2276753	19981103
AU 9910582	A	19990607	AU 1999-10582	19981103
AU 750743	B2	20020725		
EP 964859	A1	19991222	EP 1998-953132	19981103
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
TR 9901643	T1	20000121	TR 1999-1643	19981103
EE 9900391	A	20000417	EE 1999-391	19981103
EE 4154	B1	20031015		
BR 9806871	A	20000418	BR 1998-6871	19981103
NZ 336447	A	20010223	NZ 1998-336447	19981103
JP 2001508466	T	20010626	JP 1999-528277	19981103
HU 2000003737	A2	20011028	HU 2000-3737	19981103
HU 2000003737	A3	20020128		
RU 2211218	C2	20030827	RU 1999-117541	19981103
US 6303788	B1	20011016	US 1998-194647	19981201
NO 9903298	A	19990702	NO 1999-3298	19990702
NO 318197	B1	20050214		
MX 9906369	A	20000731	MX 1999-6369	19990707
HR 9900218	A1	20000831	HR 1999-218	19990713
PRIORITY APPLN. INFO.:			SE 1997-4183	19971114
			WO 1998-SE1984	19981103

AB A novel process for the synthesis of 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole, known under the generic name omeprazole, was given. Omeprazole was prepared by oxidizing 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole in an organic solvent with an oxidizing agent in the presence of a titanium complex and optionally in the presence of a base.

RX(1) OF 1



81%

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> => file caplus
FILE 'CAPLUS' ENTERED AT 13:10:04 ON 17 SEP 2009
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

FILE COVERS 1907 - 17 Sep 2009 VOL 151 ISS 12
FILE LAST UPDATED: 16 Sep 2009 (20090916/ED)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Jun 2009
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Jun 2009

CAplus now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2009.

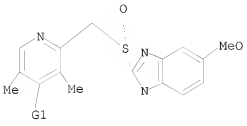
CAS Information Use Policies apply and are available at:

http://www.cas.org/legal/infopolicy.html

This file contains CAS Registry Numbers for easy and accurate substance identification.

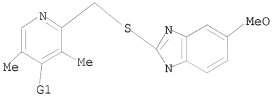
The ALL, BIB, MAX, and STD display formats in the CA/CAplus family of databases have been updated to include new citing references information. This enhancement may impact record import into database management software. For additional information, refer to NEWS 9.

=> d que
L5 STR



G1 O,N,X,NO2

Structure attributes must be viewed using STN Express query preparation.
L6 STR



G1 O,N,X,NO2

Structure attributes must be viewed using STN Express query preparation.
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L8 1345 SEA FILE=REGISTRY SSS FUL L6
L9 4931 SEA FILE=CAPLUS L7 AND L8
L10 85 SEA FILE=CAPLUS L9 AND TITANIUM
L11 20 SEA FILE=CAPLUS L10 AND CHIRAL

=> d l11 1-20 ibib abs hit

L11 ANSWER 1 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2009:649681 CAPLUS
DOCUMENT NUMBER: 150:563829
TITLE: Process for preparation of optically active benzimidazolyl sulfoxide compounds via asymmetric oxidation of prochiral sulfides using chiral transition metal complexes in water.
INVENTOR(S): Kumar, Ashok; Singh, Dharmendra; Nellithanath, Thankachen Byju; Kadam, Prasad Shankar; Vishwakarma, Harishankar Prahladkumar; Ojha, Vijay; Ninawe, Umeshkumar
PATENT ASSIGNEE(S): IPCA Laboratories Limited, India
SOURCE: PCT Int. Appl., 29pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO. KIND DATE APPLICATION NO. DATE

WO 2009066321	A2	20090528	WO 2008-IN637		20081003

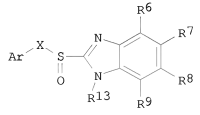
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

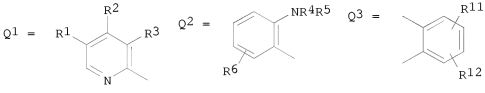
PRIORITY APPLN. INFO.:

IN 2007-MU1967	A	20071003
IN 2007-MU1968	A	20071003
IN 2007-MU1969	A	20071003

GI



I



AB Title compds. [I; R1-R3 = H, halo, NO2, alkyl, alkylthio, alkoxy, fluoroalkoxy, alkoxyalkoxy, dialkylamino, piperidino, morpholino, phenylalkyl, phenylalkoxy; R4, R5 = H, alkyl, aralkyl; R6-R9 = H, alkyl, alkoxy, halo, haloalkoxy, alkylcarbonyl, alkoxycarbonyl, oxazolyl, trifluoroalkyl; adjacent pairs of R6-R9 = atoms to form (substituted) rings; R10 = H; R3R10 = alkylene; R11, R12 = H, halo, alkyl; R13 = H, protecting group; Ar = Q1, Q2; X = CHR10, Q3], were prepared Thus, di-Et D-tartrate, diisopropylethylamine, Ti(OiPr)4, and H2O were heated together at 65-70° for 1 h; after cooling to room temperature, pyrmetazole was added followed by heating, cooling, and treatment with cumene hydroperoxide. For isolation, MeOH, KI, and KOMe were added followed by stirring and addition of PhMe to give 65-70% esomeprazole potassium comprising 97.18% sulfoxide, 2.70% sulfone, and 0.20% sulfide starting material with an S/R ratio of 99.7/0.30.

TI Process for preparation of optically active benzimidazolyl sulfoxide compounds via asymmetric oxidation of prochiral sulfides using chiral transition metal complexes in water.

ST benzimidazolyl aryl sulfoxide chiral prepn; esomeprazole prepn; sulfide asym oxidn chiral transition metal complex; pyrmetazole oxidn titanium isopropoxide tartrate cumene hydroperoxide

IT Oxidation
(asym.; preparation of optically active benzimidazolyl sulfoxide compds. via asym. oxidation of prochiral sulfides using chiral transition metal complexes in water)
IT Alcohols, uses
RL: CAT (Catalyst use); USES (Uses)
(chiral, amino; preparation of optically active benzimidazolyl sulfoxide compds. via asym. oxidation of prochiral sulfides using chiral transition metal complexes in water)
IT Glycols, uses
Transition metal complexes
RL: CAT (Catalyst use); USES (Uses)
(chiral; preparation of optically active benzimidazolyl sulfoxide compds. via asym. oxidation of prochiral sulfides using chiral transition metal complexes in water)
IT Sulfoxides
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(chiral; preparation of optically active benzimidazolyl sulfoxide compds. via asym. oxidation of prochiral sulfides using chiral transition metal complexes in water)
IT Sulfides, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(organic; preparation of optically active benzimidazolyl sulfoxide compds. via asym. oxidation of prochiral sulfides using chiral transition metal complexes in water)
IT 87-91-2 87-92-3 608-68-4 2217-15-4 7440-32-6, Titanium, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 13171-64-7 13811-71-7 26549-65-5 62563-15-9 62961-64-2 63126-10-3 63126-52-3 63976-72-7 102197-56-8 111606-71-4 117384-45-9 117384-46-0 393138-26-6 708272-61-1 708272-62-2 708272-63-3 708272-64-4 708272-65-5 708272-66-6 708272-67-7 708272-68-8 708272-69-9 708272-70-2 708272-71-3
RL: CAT (Catalyst use); USES (Uses)
(preparation of optically active benzimidazolyl sulfoxide compds. via asym. oxidation of prochiral sulfides using chiral transition metal complexes in water)
IT 161796-78-7P, Esomeprazole sodium 161796-84-5P, Esomeprazole potassium 161796-85-6P
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of optically active benzimidazolyl sulfoxide compds. via asym. oxidation of prochiral sulfides using chiral transition metal complexes in water)
IT 73590-58-6P, Omeprazole 102625-70-7P, Pantoprazole 103577-45-3P, Lansoprazole 113712-98-4P, Tenatoprazole 117976-89-3P, Rabeprazole 119141-88-7P 161973-10-0P 793668-06-1P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of optically active benzimidazolyl sulfoxide compds. via asym. oxidation of prochiral sulfides using chiral transition metal complexes in water)
IT 73590-85-9, Pyrmetazole
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of optically active benzimidazolyl sulfoxide compds. via asym. oxidation of prochiral sulfides using chiral transition metal complexes in water)

L11 ANSWER 2 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2009:593229 CAPLUS
DOCUMENT NUMBER: 151:8499
TITLE: Process for preparation of chiral sulfoxide derivatives by stereoselective oxidation
INVENTOR(S): Sun, Tianjiang; Lu, Hongguo; Zhou, Bin; Zhang, Zhenggen; Meng, Ting; Liu, Xin; Zhu, Ailin; He, Huili; Cai, Zhan; Yang, Yushe
PATENT ASSIGNEE(S): Yangtze River Pharmaceutical Group, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 9pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 101429192	A	20090513	CN 2008-10195705	20080822
PRIORITY APPLN. INFO.:			CN 2008-10195705	20080822

OTHER SOURCE(S): CASREACT 151:8499

AB This invention provides a process for the preparation of chiral sulfoxide derivs. comprising stereoselective oxidation of the corresponding thioethers in the presence of chiral titanium complex catalyst. For example, 5-(difluoromethoxy)-2-[[(3,4-dimethoxy-2-pyridinyl)methyl]thio]-1H-benzimidazole was oxidized with diisopropylbenzene hydroperoxide in toluene in the presence of di-Et D-tartrate and tetraisopropyl titanate to give (S)-Pantoprazole with 99.2% purity and >99% e.e. (70.0%). The process has the advantages of high yield, few byproducts, and high product purity.

TI Process for preparation of chiral sulfoxide derivatives by stereoselective oxidation

AB This invention provides a process for the preparation of chiral sulfoxide derivs. comprising stereoselective oxidation of the corresponding thioethers in the presence of chiral titanium complex catalyst. For example, 5-(difluoromethoxy)-2-[[(3,4-dimethoxy-2-pyridinyl)methyl]thio]-1H-benzimidazole was oxidized with diisopropylbenzene hydroperoxide in toluene in the presence of di-Et D-tartrate and tetraisopropyl titanate to give (S)-Pantoprazole with 99.2% purity and >99% e.e. (70.0%). The process has the advantages of high yield, few byproducts, and high product purity.

ST prepn chiral sulfoxide stereoselectivity oxidn titanium catalyst; prepn Omeprazole Pantoprazole Rabeprazole Lansoprazole Leminoprazole Leminorazole Saviprazole TU199

IT Sulfoxides
RL: SPN (Synthetic preparation); PREP (Preparation)
(chiral; preparation of chiral sulfoxide derivs. by stereoselective oxidation)

IT Oxidizing agents
(preparation of chiral sulfoxide derivs. by stereoselective oxidation)

IT Thioethers
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of chiral sulfoxide derivs. by stereoselective oxidation)

IT Oxidation
Oxidation catalysts
(stereoselective; preparation of chiral sulfoxide derivs. by stereoselective oxidation)

IT 87-91-2, Diethyl L-tartrate 546-68-9, Tetraisopropyl titanate 13811-71-7, Diethyl D-tartrate

RL: CAT (Catalyst use); USES (Uses)
(preparation of chiral sulfoxide derivs. by stereoselective oxidation)
IT 73590-85-9 101387-97-7 102625-64-9 103577-40-8
104340-40-1 104340-85-4 113713-24-9 117977-21-6 132969-11-0
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of chiral sulfoxide derivs. by stereoselective oxidation)
IT 101387-98-8P, RO 18-5364 103577-45-3P, Lansoprazole 104340-41-2P
104340-86-5P, Leminoprazole 113712-98-4P, TU-199 119141-88-7P
, (S)-Omeprazole 119141-89-8P, (R)-Omeprazole 121617-11-6P,
Saviprazole 142678-35-1P, (S)-Pantoprazole 142706-18-1P
177795-59-4P, (S)-Rabeprazole 177795-60-7P, (R)-Rabeprazole
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of chiral sulfoxide derivs. by stereoselective oxidation)

L11 ANSWER 3 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2009:328008 CAPLUS
DOCUMENT NUMBER: 150:515094
TITLE: Catalytic asymmetric oxidation of heteroaromatic sulfides with tert-butyl hydroperoxide catalyzed by a titanium complex with a new chiral 1,2-diphenylethane-1,2-diol ligand
AUTHOR(S): Jiang, Biao; Zhao, Xiao-Long; Dong, Jia-Jia; Wang, Wan-Jun
CORPORATE SOURCE: CAS Key Laboratory of Synthetic Chemistry of Natural Substance, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Shanghai, 200032, Peop. Rep. China
SOURCE: European Journal of Organic Chemistry (2009), (7), 987-991
CODEN: EJOCFK; ISSN: 1434-193X
PUBLISHER: Wiley-VCH Verlag GmbH & Co. KGaA
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Heteroarom. sulfoxides, especially 1H-benzimidazolyl pyridinylmethyl sulfoxides,
usually used as the blockbuster gastric proton pump inhibitors (PPIs), have been prepared highly enantioselectivity by catalytic asym. oxidation of sulfides attached to nitrogen-containing heterocycles with tert-Bu hydroperoxide in the presence of a chiral titanium complex, formed in situ from Ti(iPrO)4, chiral 1,2-diphenylethane-1,2-diol and water. The chiral sulfoxides were obtained in high yield (97%) with excellent enantiomeric excess (up to 98%).
REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
TI Catalytic asymmetric oxidation of heteroaromatic sulfides with tert-butyl hydroperoxide catalyzed by a titanium complex with a new chiral 1,2-diphenylethane-1,2-diol ligand
AB Heteroarom. sulfoxides, especially 1H-benzimidazolyl pyridinylmethyl sulfoxides,
usually used as the blockbuster gastric proton pump inhibitors (PPIs), have been prepared highly enantioselectivity by catalytic asym. oxidation of sulfides attached to nitrogen-containing heterocycles with tert-Bu hydroperoxide in the presence of a chiral titanium complex, formed in situ from Ti(iPrO)4, chiral 1,2-diphenylethane-1,2-diol and water. The chiral sulfoxides were obtained in high yield (97%) with excellent enantiomeric excess (up

to 98%).
ST benzimidazolyl pyridinylmethyl benzyl sulfide tertbutyl hydroperoxide titanium; chiral diphenylethane diol asym oxidn sulfoxide stereoselective prepn; asym oxidn catalyst titanium chiral diphenylethane diol
IT Sulfoxides
RL: SPN (Synthetic preparation); PREP (Preparation)
(alkyl, heteroaryl, chiral; stereoselective preparation of sulfoxides via Ti(iPrO)4/chiral diphenylethane diol catalyzed oxidation of benzimidazolyl pyridinylmethyl/benzyl sulfides with tert-Bu hydroperoxide)
IT Heterocyclic compounds
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(fused, nitrogen-containing; stereoselective preparation of sulfoxides via Ti(iPrO)4/chiral diphenylethane diol catalyzed oxidation of benzimidazolyl pyridinylmethyl/benzyl sulfides with tert-Bu hydroperoxide)
IT Thioethers
RL: RCT (Reactant); RACT (Reactant or reagent)
(heteroaryl; stereoselective preparation of sulfoxides via Ti(iPrO)4/chiral diphenylethane diol catalyzed oxidation of benzimidazolyl pyridinylmethyl/benzyl sulfides with tert-Bu hydroperoxide)
IT Asymmetric synthesis and induction
(stereoselective preparation of sulfoxides via Ti(iPrO)4/chiral diphenylethane diol catalyzed oxidation of benzimidazolyl pyridinylmethyl/benzyl sulfides with tert-Bu hydroperoxide)
IT Oxidation
Oxidation catalysts
(stereoselective; stereoselective preparation of sulfoxides via Ti(iPrO)4/chiral diphenylethane diol catalyzed oxidation of benzimidazolyl pyridinylmethyl/benzyl sulfides with tert-Bu hydroperoxide)
IT 546-68-9, Titanium isopropoxide 128574-71-0
RL: CAT (Catalyst use); USES (Uses)
(stereoselective preparation of sulfoxides via Ti(iPrO)4/chiral diphenylethane diol catalyzed oxidation of benzimidazolyl pyridinylmethyl/benzyl sulfides with tert-Bu hydroperoxide)
IT 51290-77-8 73590-85-9 73590-87-1 102625-64-9 103577-40-8 103577-86-2 117977-21-6 569650-10-8 569650-11-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(stereoselective preparation of sulfoxides via Ti(iPrO)4/chiral diphenylethane diol catalyzed oxidation of benzimidazolyl pyridinylmethyl/benzyl sulfides with tert-Bu hydroperoxide)
IT 75-91-2, tert-Butyl hydroperoxide
RL: RGT (Reagent); RACT (Reactant or reagent)
(stereoselective preparation of sulfoxides via Ti(iPrO)4/chiral diphenylethane diol catalyzed oxidation of benzimidazolyl pyridinylmethyl/benzyl sulfides with tert-Bu hydroperoxide)
IT 119141-88-7P, Esomeprazole 138530-95-7P 142678-35-1P 161796-78-7P, Esomeprazole sodium 177795-59-4P 915403-95-1P 915403-96-2P 1149620-37-0P 1149620-38-1P 1149620-39-2P
RL: SPN (Synthetic preparation); PREP (Preparation)
(stereoselective preparation of sulfoxides via Ti(iPrO)4/chiral diphenylethane diol catalyzed oxidation of benzimidazolyl pyridinylmethyl/benzyl sulfides with tert-Bu hydroperoxide)

L11 ANSWER 4 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:1430957 CAPLUS
DOCUMENT NUMBER: 149:556627
TITLE: Process for preparation of esomeprazole by

enantioselective oxidation of the corresponding sulfide with peroxides in presence of chiral titanium catalyst

INVENTOR(S): Khomenko, T. M.; Volcho, K. P.; Salakhutdinov, N. F.; Tolstikov, G. A.

PATENT ASSIGNEE(S): Novosibirskii Institut Organicheskoi Khimii im. N. N. Vorozhtsova SO RAN, Russia

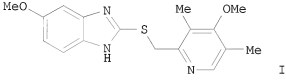
SOURCE: Russ., 4pp.
CODEN: RUXXE7

DOCUMENT TYPE: Patent
LANGUAGE: Russian
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
RU 2339631	C1	20081127	RU 2007-113738	20070412

PRIORITY APPLN. INFO.: RU 2007-113738 20070412
OTHER SOURCE(S): CASREACT 149:556627

GI



I

AB Esomeprazole (I) and/or its salts, useful as an anti-ulcer agent (no data), is prepared by enantioselective oxidation with organic peroxides of the corresponding sulfide, 5-methoxy-2-[(4-methoxy-3,5-dimethylpyridin-2-yl)methylthio]-1H-benzo[d]imidazole, in an organic solvent in presence of a catalytic complex of titanium(IV) which has two chiral ligands: a chiral diol (preferably D-diethyl tartrate) and a chiral amine (preferably N,N-dimethyl-(R)-1-phenylethylamine). E.g., treating 1.66 mmol omeprazole sulfide in 2.5 mL PhMe with 9 μL H2O, 1.16 mmol di-Et D-tartrate and 0.77 mmol Ti(OPr-iso)4, at 55° and stirring 1 h, then cooling to 30° and adding 0.81 mmol N,N-dimethyl-(R)-1-phenylethylamine and stirring 15 min, then adding 1.58 mmol cumene hydroperoxide as an 86.5% solution in cumene and stirring 4.5 h at 30° gave, after workup, a mixture containing 82.3% of the desired sulfide, which upon treatment with NaOH in H2O/MeCN gave a 64% overall yield of esomeprazole sodium.

TI Process for preparation of esomeprazole by enantioselective oxidation of the corresponding sulfide with peroxides in presence of chiral titanium catalyst

AB Esomeprazole (I) and/or its salts, useful as an anti-ulcer agent (no data), is prepared by enantioselective oxidation with organic peroxides of the corresponding sulfide, 5-methoxy-2-[(4-methoxy-3,5-dimethylpyridin-2-yl)methylthio]-1H-benzo[d]imidazole, in an organic solvent in presence of a catalytic complex of titanium(IV) which has two chiral ligands: a chiral diol (preferably D-diethyl tartrate) and a chiral amine (preferably N,N-dimethyl-(R)-1-phenylethylamine). E.g., treating 1.66 mmol omeprazole sulfide in 2.5 mL PhMe with 9 μL H2O, 1.16 mmol di-Et D-tartrate and 0.77 mmol Ti(OPr-iso)4, at 55° and stirring 1 h, then cooling to 30° and adding 0.81 mmol N,N-dimethyl-(R)-1-phenylethylamine and stirring 15 min, then adding 1.58

mmol cumene hydroperoxide as an 86.5% solution in cumene and stirring 4.5 h at 30° gave, after workup, a mixture containing 82.3% of the desired sulfide, which upon treatment with NaOH in H2O/MeCN gave a 64% overall yield of esomeprazole sodium.

IT Amines, uses
RL: CAT (Catalyst use); USES (Uses)
(chiral, titanium complexes; process for preparation of esomeprazole by enantioselective oxidation of corresponding sulfide with peroxides in presence of titanium catalyst with both chiral amine and chiral diol ligands)

IT Glycols, uses
RL: CAT (Catalyst use); USES (Uses)
(chiral; process for preparation of esomeprazole by enantioselective oxidation of corresponding sulfide with peroxides in presence of titanium catalyst with both chiral amine and chiral diol ligands)

IT Peroxides, reactions
RL: RGT (Reagent); RACT (Reactant or reagent)
(organic; process for preparation of esomeprazole by enantioselective oxidation of corresponding sulfide with peroxides in presence of titanium catalyst with both chiral amine and chiral diol ligands)

IT Asymmetric synthesis and induction
(process for preparation of esomeprazole by enantioselective oxidation of corresponding sulfide with peroxides in presence of titanium catalyst with both chiral amine and chiral diol ligands)

IT Oxidation catalysts
(stereoselective; process for preparation of esomeprazole by enantioselective oxidation of corresponding sulfide with peroxides in presence of titanium catalyst with both chiral amine and chiral diol ligands)

IT 546-68-9, Titanium isopropoxide 7440-32-6D, Titanium, chiral organic derivs. 13811-71-7, Diethyl D-tartrate 13811-71-7D, Diethyl D-tartrate, titanium complexes 17279-31-1 19342-01-9 19342-01-9D, titanium complexes
RL: CAT (Catalyst use); USES (Uses)
(process for preparation of esomeprazole by enantioselective oxidation of corresponding sulfide with peroxides in presence of titanium catalyst with both chiral amine and chiral diol ligands)

IT 73590-85-9, Omeprazole sulfide
RL: RCT (Reactant); RACT (Reactant or reagent)
(process for preparation of esomeprazole by enantioselective oxidation of corresponding sulfide with peroxides in presence of titanium catalyst with both chiral amine and chiral diol ligands)

IT 80-15-9, Cumene hydroperoxide
RL: RGT (Reagent); RACT (Reactant or reagent)
(process for preparation of esomeprazole by enantioselective oxidation of corresponding sulfide with peroxides in presence of titanium catalyst with both chiral amine and chiral diol ligands)

IT 119141-88-7P, Esomeprazole 161796-78-7P, Esomeprazole sodium
RL: SPN (Synthetic preparation); PREP (Preparation)
(process for preparation of esomeprazole by enantioselective oxidation of corresponding sulfide with peroxides in presence of titanium catalyst with both chiral amine and chiral diol

ligands)

L11 ANSWER 5 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:1143447 CAPLUS
DOCUMENT NUMBER: 149:555936
TITLE: Synthesis of optically active 2,5-dialkylcyclohexane-1,4-diols and their application in the asymmetric oxidation of sulfides
AUTHOR(S): Sun, Jiangtao; Yang, Minghua; Dai, Zhenya; Zhu, Chengjian; Hu, Hongwen
CORPORATE SOURCE: Department of Chemistry, Nanjing University, Nanjing, 210093, Peop. Rep. China
SOURCE: Synthesis (2008), (16), 2513-2518
CODEN: SYNTBF; ISSN: 0039-7881
PUBLISHER: Georg Thieme Verlag
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 149:555936
AB A simple and efficient approach to obtain optically pure 1,4-diols was established. The asym. oxidation of sulfides to sulfoxides with cumyl hydroperoxide in moderate yields and moderate to high enantioselectivities (≤84%) catalyzed by chiral Ti/1,4-diols complexes was achieved. An ee of 76% was obtained in the asym. synthesis of esomeprazole.
REFERENCE COUNT: 80 THERE ARE 80 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
AB A simple and efficient approach to obtain optically pure 1,4-diols was established. The asym. oxidation of sulfides to sulfoxides with cumyl hydroperoxide in moderate yields and moderate to high enantioselectivities (≤84%) catalyzed by chiral Ti/1,4-diols complexes was achieved. An ee of 76% was obtained in the asym. synthesis of esomeprazole.
ST alkylcyclohexanediol resoln chiral ligand titanium catalyzed asym oxidn; sulfide asym oxidn titanium catalyst; thioether asym oxidn titanium catalyst; sulfoxide asym synthesis; esomeprazole asym synthesis
IT Asymmetric synthesis and induction
(alkylcyclohexanediols as chiral ligands for titanium -catalyzed asym. oxidation of sulfides)
IT Sulfides, reactions
Thioethers
RL: RCT (Reactant); RACT (Reactant or reagent)
(alkylcyclohexanediols as chiral ligands for titanium -catalyzed asym. oxidation of sulfides)
IT Sulfoxides
RL: SPN (Synthetic preparation); PREP (Preparation)
(alkylcyclohexanediols as chiral ligands for titanium -catalyzed asym. oxidation of sulfides)
IT Ligands
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(chiral; alkylcyclohexanediols as chiral ligands for titanium-catalyzed asym. oxidation of sulfides)
IT Resolution (separation)
(resolution of alkylcyclohexanediols as chiral ligands for titanium-catalyzed asym. oxidation of sulfides)
IT Oxidation
Oxidation catalysts
(stereoselective; alkylcyclohexanediols as chiral ligands for titanium-catalyzed asym. oxidation of sulfides)

IT 3112-85-4P, Methyl phenyl sulfone
RL: BYP (Byproduct); PREP (Preparation)
(alkylcyclohexanediols as chiral ligands for titanium -catalyzed asym. oxidation of sulfides)
IT 100-68-5, Methyl phenyl sulfide 123-09-1, 4-Chlorophenyl methyl sulfide 623-13-2 701-57-5, Methyl 4-nitrophenyl sulfide 831-91-4, Benzyl phenyl sulfide 1879-16-9, 4-Methoxyphenyl methyl sulfide 2388-74-1, 3-Methoxyphenyl methyl sulfide 5023-60-9, Benzyl 4-tolyl sulfide 19614-16-5, 2-Bromophenyl methyl sulfide 33733-73-2, 3-Bromophenyl methyl sulfide 70026-35-6 73590-85-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(alkylcyclohexanediols as chiral ligands for titanium -catalyzed asym. oxidation of sulfides)
IT 1519-39-7P 4820-07-9P 4850-71-9P 20246-02-0P 28227-62-5P 93222-06-1P 93381-75-0P 114129-44-1P 119141-88-7P, Esomeprazole 126218-83-5P 188539-86-8P 812694-12-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(alkylcyclohexanediols as chiral ligands for titanium -catalyzed asym. oxidation of sulfides)
IT 546-68-9, Titanium(IV) isopropoxide
RL: CAT (Catalyst use); USES (Uses)
(resolution of alkylcyclohexanediols as chiral ligands for titanium-catalyzed asym. oxidation of sulfides)
IT 131063-54-2P 131063-58-6P 131063-59-7P 136522-58-2P
RL: CAT (Catalyst use); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(resolution of alkylcyclohexanediols as chiral ligands for titanium-catalyzed asym. oxidation of sulfides)
IT 21286-54-4, d-Camphorsulfonyl chloride 136522-60-6 136522-61-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(resolution of alkylcyclohexanediols as chiral ligands for titanium-catalyzed asym. oxidation of sulfides)
IT 1079104-40-7P 1079104-41-8P 1079104-42-9P 1079104-45-2P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(resolution of alkylcyclohexanediols as chiral ligands for titanium-catalyzed asym. oxidation of sulfides)

L11 ANSWER 6 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:944034 CAPLUS
DOCUMENT NUMBER: 149:231618
TITLE: Process for the preparation of optically pure omeprazole
INVENTOR(S): Plaper, Igor; Pecavar, Anica; Kotar-Jordan, Berta; Zajc, Natalija; Vrbinc, Miha; Kocevar, Anton; Pelko, Mitja; Veverka, Miroslav; Veverkova, Eva; Smodis, Janez; Zupet, Rok
PATENT ASSIGNEE(S): Krka, Tovarna Zdravil, D.D., Novo Mesto, Slovenia
SOURCE: PCT Int. Appl., 95pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008092939	A2	20080807	WO 2008-EP51230	20080131
WO 2008092939	A3	20090129		

W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,

CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AP, EA, EP, OA

SI 22447 A 20080831 SI 2007-24 20070131

SI 22490 A 20081031 SI 2007-78 20070328

EP 2048144 A1 20090415 EP 2007-19823 20071010

R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, AL, BA, HR, MK, RS

PRIORITY APPLN. INFO.: SI 2007-24 A 20070131

SI 2007-78 A 20070328

EP 2007-19823 A 20071010

OTHER SOURCE(S): MARPAT 149:231618

AB The present invention relates to a process for the preparation of substantially optically pure omeprazole, or a pharmaceutically acceptable salt or solvate thereof. The invention also relates to a process for preparing a pharmaceutical composition comprising the substantially optically pure omeprazole or the pharmaceutically acceptable salt or solvate thereof and to intermediates useful for the preparation of optically pure omeprazole. Thus, tablets of esomeprazole magnesium salt comprised (in wt%): Core material: Esomeprazole Mg 38.7, cellactose 48.9, microcryst. cellulose 7.4, croscarmellose sodium 3.0, magnesium stearate 2.0; Separating layer: core material 88.7, methylcellulose 8.6, titanium dioxide 0.3, iron oxide yellow 0.1, propylene glycol 2.3; Enteric coating: tablets with separating layer 92.8, methacrylic acid Et acrylate copolymer 4.9, macrogol 0.5, talc 1.8.

AB The present invention relates to a process for the preparation of substantially optically pure omeprazole, or a pharmaceutically acceptable salt or solvate thereof. The invention also relates to a process for preparing a pharmaceutical composition comprising the substantially optically pure omeprazole or the pharmaceutically acceptable salt or solvate thereof and to intermediates useful for the preparation of optically pure omeprazole. Thus, tablets of esomeprazole magnesium salt comprised (in wt%): Core material: Esomeprazole Mg 38.7, cellactose 48.9, microcryst. cellulose 7.4, croscarmellose sodium 3.0, magnesium stearate 2.0; Separating layer: core material 88.7, methylcellulose 8.6, titanium dioxide 0.3, iron oxide yellow 0.1, propylene glycol 2.3; Enteric coating: tablets with separating layer 92.8, methacrylic acid Et acrylate copolymer 4.9, macrogol 0.5, talc 1.8.

IT Amines

Quaternary ammonium compounds

RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

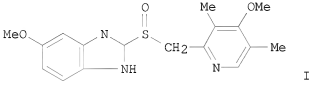
(chiral; process for preparation of optically pure omeprazole)

IT 546-68-9P, Titanium(IV) isopropoxide 7631-86-9DP, Silica, bound to di-Me N-3,5-dinitrobenzoyl-α-amino-2,2-dimethyl-4-pentenyl phosphonate 13811-71-7P, (2S,3S)-(-)-Diethyl tartrate 17199-29-0P, (S)-(+)-Mandelic acid 55380-59-1P 69212-47-1P, N-Benzylquininium bromide 69881-64-7P, Quinine methohydroxide 73590-58-6DP, Omeprazole, 5-hydroxy-, 5-O-desmethyl- derivs. 73804-27-0P, N-Methylcinchonidinium iodide 137694-03-2DP, bound to mercaptopropyl silica 148595-92-0P 158195-40-5P, O-Allyl-N-benzylcinchonidinium

bromide 1042944-21-7P
RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); PREP (Preparation); PROC (Process)
(process for preparation of optically pure omeprazole)
IT 1042167-32-7P 1042167-39-4P 1042167-52-1P
RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); PROC (Process); USES (Uses)
(process for preparation of optically pure omeprazole)
IT 73590-58-6P, Omeprazole 119141-88-7P,
S-(-)-Omeprazole 119141-89-8P
RL: PEP (Physical, engineering or chemical process); PUR (Purification or recovery); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); PROC (Process); USES (Uses)
(process for preparation of optically pure omeprazole)
IT 1042167-74-7P
RL: PRP (Properties); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(process for preparation of optically pure omeprazole)
IT 1042167-65-6P 1042167-67-8P 1042167-70-3P
1042167-72-5P
RL: PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(process for preparation of optically pure omeprazole)
IT 217087-09-7P, (S)-Omeprazole magnesium trihydrate 217087-10-0P,
(S)-Omeprazole magnesium dihydrate 1042167-21-4P
1042167-23-6P 1042167-25-8P 1042167-27-0P
1042167-28-1P 1042167-30-5P 1042167-33-8P
1042167-35-0P 1042167-36-1P 1042167-37-2P
1042167-38-3P 1042167-40-7P 1042167-41-8P
1042167-42-9P 1042167-44-1P 1042167-45-2P
1042167-47-4P 1042167-48-5P 1042167-49-6P
1042167-50-9P 1042167-51-0P 1042167-54-3P
1042167-55-4P 1042167-57-6P 1042167-58-7P
1042167-59-8P 1042167-60-1P
RL: PUR (Purification or recovery); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(process for preparation of optically pure omeprazole)
IT 161973-10-0P, Esomeprazole magnesium 793668-08-3P
942472-45-9P 1042167-61-2P 1042167-62-3P
1042167-63-4P
RL: PUR (Purification or recovery); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(process for preparation of optically pure omeprazole)
IT 114801-85-3P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(process for preparation of optically pure omeprazole)
IT 57-13-6, Urea, biological studies 57-50-1, Sucrose, biological studies 57-55-6, Propylene glycol, biological studies 69-65-8, Mannitol 77-93-0, Triethyl citrate 151-21-3, Sodium lauryl sulfate, biological studies 546-93-0, Magnesium carbonate 557-04-0, Magnesium stearate 4070-80-8, Sodium stearyl fumarate 7778-18-9, Calcium sulphate 9003-39-8, Povidone 9004-65-3, Hypromellose 9004-67-5, Methylcellulose 9005-25-8, Starch, biological studies 9005-65-6, Polysorbate 80 9010-88-2, Ethyl acrylate methyl methacrylate copolymer 10103-46-5, Calcium phosphate 13463-67-7, Titanium dioxide, biological studies 14807-96-6, Talc, biological studies 25212-88-8, Methacrylic acid ethyl acrylate copolymer 25322-68-3, Macrogol 31566-31-1,

Glycerol monostearate 39710-20-8 51274-00-1, Iron Oxide Yellow 64044-51-5, Lactose monohydrate 74811-65-7, Croscarmellose sodium 95382-33-5 106392-12-5, Poloxamer 149202-17-5, Cellactose 150607-22-0, Zinc carbonate hydroxide 815617-93-7, Opadry II White
RL: THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(process for preparation of optically pure omeprazole)

L11 ANSWER 7 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:382314 CAPLUS
DOCUMENT NUMBER: 149:556518
TITLE: An efficient procedure for the synthesis of Esomeprazole using a titanium complex with two chiral ligands
AUTHOR(S): Khomenko, T. M.; Volcho, K. P.; Komarova, N. I.; Salakhutdinov, N. F.
CORPORATE SOURCE: Vorozhtsov Novosibirsk Institute of Organic Chemistry, Siberian Division, Russian Academy of Sciences, Novosibirsk, 630090, Russia
SOURCE: Russian Journal of Organic Chemistry (2008), 44(1), 124-127
CODEN: RJOCEQ; ISSN: 1070-4280
PUBLISHER: Pleiades Publishing, Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
OTHER SOURCE(S): CASREACT 149:556518
GI



I

AB A procedure has been proposed for the selective preparation of Esomeprazole [(S)-I] via asym. oxidation of the corresponding prochiral sulfide in the presence of a catalytic complex derived from titanium(IV) isopropoxide and two different chiral ligands, di-Et D-tartrate and (R)-N,N-dimethyl-1-phenylethanamine.
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
TI An efficient procedure for the synthesis of Esomeprazole using a titanium complex with two chiral ligands
AB A procedure has been proposed for the selective preparation of Esomeprazole [(S)-I] via asym. oxidation of the corresponding prochiral sulfide in the presence of a catalytic complex derived from titanium(IV) isopropoxide and two different chiral ligands, di-Et D-tartrate and (R)-N,N-dimethyl-1-phenylethanamine.
ST asym prepn Esomeprazole; titanium complex tartrate phenylethanamine asym prepn Esomeprazole
IT Oxidation
Oxidation catalysts
(stereoselective; preparation of Esomeprazole using titanium complex with two chiral ligands as oxidation catalyst)
IT 546-68-9, Titanium tetraisopropoxide 13811-71-7, Diethyl D-tartrate 17279-31-1 19342-01-9
RL: CAT (Catalyst use); USES (Uses)

(preparation of Esomeprazole using titanium complex with two chiral ligands as oxidation catalyst)
IT 73590-85-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of Esomeprazole using titanium complex with two chiral ligands as oxidation catalyst)
IT 119141-88-7P, Esomeprazole 161796-78-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of Esomeprazole using titanium complex with two chiral ligands as oxidation catalyst)

L11 ANSWER 8 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:365485 CAPLUS
DOCUMENT NUMBER: 148:355792
TITLE: Preparation of unsym. heterocyclylsulfoxide derivatives for treating gastrointestinal disorders
INVENTOR(S): Larsson, Magnus Erik; Stenhede, Urban Jan; Sorensen, Henrik; Von Unge, Sverker Per Oskar; Cotton, Hanna Kristina
PATENT ASSIGNEE(S): Astra Aktiebolag, Swed.
SOURCE: U.S., 21pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5948789	A	19990907	US 1995-492087	19950714
SE 9402510	A	19960116	SE 1994-2510	19940715
SE 504459	C2	19970217		
WO 9602535	A1	19960201	WO 1995-SE818	19950703
W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT				
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				

PRIORITY APPLN. INFO.: SE 1994-2510 A 19940715
WO 1995-SE818 W 19950703
OTHER SOURCE(S): CASREACT 148:355792; MARPAT 148:355792
AB Enantiomeric R1ZSOR2 (I) [R1 = (un)substituted 2-pyridyl, (un)substituted 2-(R4R5N)C6H4; R2 = (un)substituted 2-benzimidazolyl, thieno[3,4-d]imidazol-2-yl, etc.; R4,R5 = H, (ar)alkyl; Z = CH2, (un)substituted 1,2-phenylene, etc.] were prepared by oxidation of prochiral R1ZSR2 in the presence of a chiral Ti complex and a base. I are disclosed for treatment of gastrointestinal disorders (no data).
OS.CITING REF COUNT: 19 THERE ARE 19 CAPLUS RECORDS THAT CITE THIS RECORD (25 CITINGS)
REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
AB Enantiomeric R1ZSOR2 (I) [R1 = (un)substituted 2-pyridyl, (un)substituted 2-(R4R5N)C6H4; R2 = (un)substituted 2-benzimidazolyl, thieno[3,4-d]imidazol-2-yl, etc.; R4,R5 = H, (ar)alkyl; Z = CH2, (un)substituted 1,2-phenylene, etc.] were prepared by oxidation of prochiral R1ZSR2 in the presence of a chiral Ti complex and a base. I are disclosed for treatment of gastrointestinal disorders (no data).
IT 546-68-9, Titanium isopropoxide

RL: CAT (Catalyst use); USES (Uses)
(preparation of unsym. heterocyclylsulfoxide enantiomers for treatment of gastrointestinal disorders)

IT 119141-88-7P 119141-89-8P 138530-94-6P
138530-95-7P 142678-35-1P 142706-18-1P 154461-48-0P 156601-78-4P
156601-79-5P 161796-77-6P 161796-78-7P
170431-13-7P 170431-14-8P 175078-93-0P 177540-99-7P 177541-00-3P
177541-01-4P 177795-59-4P 177795-60-7P 177932-96-6P
RL: PAC (Pharmacological activity); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(preparation of unsym. heterocyclylsulfoxide enantiomers for treatment of gastrointestinal disorders)

IT 102625-64-9 103577-40-8 104340-85-4 117977-21-6 130368-64-8
136176-91-5 136609-26-2 139645-03-7 177541-04-7 177541-05-8
922730-98-1
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of unsym. heterocyclylsulfoxide enantiomers for treatment of gastrointestinal disorders)

L11 ANSWER 9 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:191960 CAPLUS
DOCUMENT NUMBER: 148:262584
TITLE: Process for preparation of chiral sulfoxide compounds via asymmetrical oxidation
INVENTOR(S): Singh, Anand; Singh, Khushwant; Dubey, Sushil Kumar
PATENT ASSIGNEE(S): Jubilant Organosys Limited, India
SOURCE: PCT Int. Appl., 22pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008018091	A1	20080214	WO 2007-IN335	20070808
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
IN 2006DE01796	A	20080606	IN 2006-DE1796	20060808
CA 2660112	A1	20080214	CA 2007-2660112	20070808
EP 2054403	A1	20090506	EP 2007-805639	20070808
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, AL, BA, HR, MK, RS				

PRIORITY APPLN. INFO.: IN 2006-DE1796 A 20060808
WO 2007-IN335 W 20070808
OTHER SOURCE(S): CASREACT 148:262584; MARPAT 148:262584
AB This invention pertains to a process for the preparation of sulfoxide compound, in particular, substituted 2-(2-pyridinylmethylsulfinyl)-1H-

benzimidazoles, by asym. oxidizing prochiral sulfide substrates with an effective amount of oxidizing agent in the presence of a chiral transition metal complex without using an organic solvent and base. For example, 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole was oxidized with cumene hydroperoxide in presence of titanium isopropoxide and L- (-)-di-Et tartrate, and the sulfoxide product was treated with methanolic potassium hydroxide to give (S)-5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole potassium salt. Advantageously, the process is economically viable and eco-friendly for the preparation of sulfoxides either as a single enantiomer or in an enantiomerically enriched form, which avoids the use of organic solvent and base, and the product is free from sulfone byproduct.

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Process for preparation of chiral sulfoxide compounds via asymmetrical oxidation

AB This invention pertains to a process for the preparation of sulfoxide compound, in particular, substituted 2-(2-pyridinylmethylsulfinyl)-1H-benzimidazoles, by asym. oxidizing prochiral sulfide substrates with an effective amount of oxidizing agent in the presence of a chiral transition metal complex without using an organic solvent and base. For example, 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole was oxidized with cumene hydroperoxide in presence of titanium isopropoxide and L- (-)-di-Et tartrate, and the sulfoxide product was treated with methanolic potassium hydroxide to give (S)-5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole potassium salt. Advantageously, the process is economically viable and eco-friendly for the preparation of sulfoxides either as a single enantiomer or in an enantiomerically enriched form, which avoids the use of organic solvent and base, and the product is free from sulfone byproduct.

ST prepn sulfoxide asym oxidn hydroperoxide chiral transition metal catalyst

IT Oxidation
Oxidation catalysts
(stereoselective; preparation of chiral sulfoxide compds. via asym. oxidation)

IT 7732-18-5, Water, uses
RL: CAT (Catalyst use); USES (Uses)
(preparation of chiral sulfoxide compds. via asym. oxidation)

IT 161796-84-5P
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of chiral sulfoxide compds. via asym. oxidation)

IT 95382-33-5P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of chiral sulfoxide compds. via asym. oxidation)

IT 73590-85-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of chiral sulfoxide compds. via asym. oxidation)

IT 80-15-9, Cumene hydroperoxide 87-91-2 546-68-9, Titanium isopropoxide 1310-58-3, Potassium hydroxide, reactions 7791-18-6, Magnesium chloride hexahydrate 14691-59-9, Peroxide (HO21-)
RL: RGT (Reagent); RACT (Reactant or reagent)
(preparation of chiral sulfoxide compds. via asym. oxidation)

L11 ANSWER 10 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:874516 CAPLUS
DOCUMENT NUMBER: 147:257772
TITLE: Process for preparation of chiral

benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents.

INVENTOR(S): Dubey, Sushil Kumar; Vig, Gaurav; Singh, Anand; Tripathi, Sushil; Paul, Soumendu

PATENT ASSIGNEE(S): Jubilant Organosys Limited, India

SOURCE: PCT Int. Appl., 21pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007088559	A1	20070809	WO 2007-IN35	20070131

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: IN 2006-DE271 A 20060201
OTHER SOURCE(S): CASREACT 147:257772; MARPAT 147:257772

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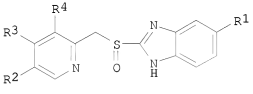


I

AB Title compds. (I; R1-R4 = H, alkyl, alkoxy, aryl, aryloxy), were prepared by treatment of the corresponding prochiral sulfides with chiral transition metal complexes and oxidizing agents optionally in presence of an organic solvent, wherein the chiral ligands comprise dicyclohexylidene, diacetonide, or benzylidene derivs. of sugars. Thus, vanadium oxytripropoxide and 1,2,4,5-Di-O-cyclohexylidene-D-fructofuranose were stirred together for 10-15 min in PhMe; 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole and H2O were added and the mixture was heated at 50-55° for 1 h; the mixture was cooled to 25-30° followed by addition of diisopropylethylamine and cumene hydroperoxide over 1 h followed by stirring for 45 min. and workup to give 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole, sodium salt in 75% enantiomeric excess.

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

TI Process for preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents.

AB Title compds. (I; R1-R4 = H, alkyl, alkoxy, aryl, aryloxy), were prepared by treatment of the corresponding prochiral sulfides with chiral transition metal complexes and oxidizing agents optionally in presence of an organic solvent, wherein the chiral ligands comprise dicyclohexylidene, diacetonide, or benzylidene derivs. of sugars. Thus, vanadium oxytripropoxide and 1,2,4,5-Di-O-cyclohexylidene-D-fructofuranose were stirred together for 10-15 min in PhMe; 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole and H2O were added and the mixture was heated at 50-55° for 1 h; the mixture was cooled to 25-30° followed by addition of diisopropylethylamine and cumene hydroperoxide over 1 h followed by stirring for 45 min. and workup to give 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole, sodium salt in 75% enantiomeric excess.

ST benzimidazolyl pyridylmethyl sulfoxide chiral prepn; omeprazole chiral prepn; sulfide oxidn chiral transition metal complex

IT Hydroperoxides
RL: RGT (Reagent); RACT (Reactant or reagent)
(alkyl; preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Hydroperoxides
RL: RGT (Reagent); RACT (Reactant or reagent)
(aralkyl; preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Sulfoxides
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(chiral; preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Bases, reactions
RL: RGT (Reagent); RACT (Reactant or reagent)
(inorg.; preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Monosaccharides
RL: CAT (Catalyst use); USES (Uses)
(ketohexoses; preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Bases, reactions
RL: RGT (Reagent); RACT (Reactant or reagent)
(organic; preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Oxidation
Oxidation catalysts
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Disaccharides
Hexoses

Oligosaccharides, uses
Pentoses
RL: CAT (Catalyst use); USES (Uses)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Aromatic hydrocarbons, uses
RL: NUU (Other use, unclassified); USES (Uses)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Hydrocarbons, uses
RL: NUU (Other use, unclassified); USES (Uses)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Nitriles, uses
RL: NUU (Other use, unclassified); USES (Uses)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Sulfides, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Peroxides, reactions
RL: RGT (Reagent); RACT (Reactant or reagent)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT Peroxy acids
RL: RGT (Reagent); RACT (Reactant or reagent)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT 157-26-6D, Dioxirane, derivs.
RL: RGT (Reagent); RACT (Reactant or reagent)
(chiral; preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT 582-52-5, 1,2:5,6-Di-O-isopropylidene-α-D-glucofuranose 1686-23-3 1707-77-3, 1,2:5,6-Di-O-isopropylidene-D-mannitol 3051-89-6 3150-15-0, Methyl 2,3-anhydro-4,6-O-benzylidene-α-D-allopyranoside 3162-96-7, Methyl 4,6-O-Benzylidene-α-D-glucopyranoside 5328-47-2, Methyl 4,6-O-benzylidene-α-D-altropyranoside 6884-01-1 7440-32-6, Titanium, uses 7440-58-6, Hafnium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 13322-88-8 13322-89-9 16832-21-6, 1,2-O-Cyclohexylidene-α-D-glucofuranose 22250-06-2, 1,2-O-Cyclohexylidene-α-D-xylofuranose 23397-76-4, 1,2:5,6-Di-O-cyclohexylidene-α-D-glucofuranose 29411-57-2, Methyl α-D-altropyranoside 945614-29-9
RL: CAT (Catalyst use); USES (Uses)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

IT 73590-58-6P, 1H-Benzimidazole, 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]sulfinyl]- 95510-70-6P, 5-Methoxy-2-[[(4-methoxy-3,5-dimethylpyridin-2-yl)methyl]sulfinyl]-1H-benzimidazole sodium salt

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)
IT 73590-85-9, 5-Methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)
IT 37222-66-5, Oxone
RL: RGT (Reagent); RACT (Reactant or reagent)
(preparation of chiral benzimidazolyl pyridylmethyl sulfoxides from the corresponding sulfides using chiral transition metal complexes and oxidizing agents)

L11 ANSWER 11 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:872604 CAPLUS
DOCUMENT NUMBER: 147:322979
TITLE: Method for preparing chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole and S-tenatoprazole
INVENTOR(S): Wang, Qinghe; Cheng, Maosheng
PATENT ASSIGNEE(S): Shenyang Pharmaceutical University, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 6pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 101012141	A	20070808	CN 2007-10010273	20070202

PRIORITY APPLN. INFO.: CN 2007-10010273 20070202
OTHER SOURCE(S): CASREACT 147:322979
AB The invention provides a method for the preparation of chiral sulfoxides, which comprises oxidizing the corresponding sulfides with peroxides in the presence of titanium or zirconium tetraalkoxides and chiral β-amino alcs. The method was successfully applied to the synthesis of S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, and S-tenatoprazole, which are useful as proton pump inhibitors.
TI Method for preparing chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole and S-tenatoprazole
AB The invention provides a method for the preparation of chiral sulfoxides, which comprises oxidizing the corresponding sulfides with peroxides in the presence of titanium or zirconium tetraalkoxides and chiral β-amino alcs. The method was successfully applied to the synthesis of S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, and S-tenatoprazole, which are useful as proton pump inhibitors.
ST chiral sulfoxide prepn; amino alc chiral ligand sulfide oxidn; omeprazole lansoprazole pantoprazole rabeprazole tenatoprazole asym synthesis
IT Alcohols, uses
RL: CAT (Catalyst use); USES (Uses)
(chiral, amino; preparation of chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole,

S-tenatoprazole, oxidation of sulfides using β-amino alcs. as chiral ligands)

IT Ligands
RL: CAT (Catalyst use); USES (Uses)
(chiral; preparation of chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, S-tenatoprazole, oxidation of sulfides using β-amino alcs. as chiral ligands)

IT Sulfoxides
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(chiral; preparation of chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, S-tenatoprazole, oxidation of sulfides using β-amino alcs. as chiral ligands)

IT Asymmetric synthesis and induction
Oxidation
Oxidation catalysts
(preparation of chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, S-tenatoprazole, oxidation of sulfides using β-amino alcs. as chiral ligands)

IT Sulfides, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, S-tenatoprazole, oxidation of sulfides using β-amino alcs. as chiral ligands)

IT 546-68-9, Tetraisopropoxytitanium 1071-76-7, Zirconium butoxide 2026-48-4, S-Valinol 2081-12-1, Zirconium tert-butoxide 2171-98-4, Zirconium isopropoxide 2749-11-3 2899-29-8, L-Tryptophanol 2899-37-8 3087-36-3, Tetraethoxytitanium 3087-37-4, Tetrapropoxytitanium 3087-39-6 3182-95-4 3228-51-1, L-Threoninol 3374-12-7, Tetraisobutoxytitanium 5034-68-4, L-Tyrosinol 5593-70-4, Tetrabutoxytitanium 5856-62-2 7533-40-6 13421-85-7, Zirconium isobutoxide 16504-57-7 18267-08-8, Zirconium ethoxide 20989-17-7 23356-96-9, L-Prolinol 23519-77-9, Zirconium propoxide 24629-25-2, L-Isoleucinol 61477-39-2 104587-51-1 110690-36-3
RL: CAT (Catalyst use); USES (Uses)
(preparation of chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, S-tenatoprazole, oxidation of sulfides using β-amino alcs. as chiral ligands)

IT 119141-88-7P, S-Omeprazole 138530-95-7P, S-Lansoprazole 142678-35-1P, S-Pantoprazole 177795-59-4P, S-Rabeprazole 705968-86-1P, S-Tenatoprazole
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, S-tenatoprazole, oxidation of sulfides using β-amino alcs. as chiral ligands)

IT 80-15-9 110-05-4, tert-Butyl peroxide 73590-85-9 102625-64-9 103577-40-8 113713-24-9 117977-21-6
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of chiral sulfoxides, especially S-omeprazole, S-lansoprazole, S-pantoprazole, S-rabeprazole, S-tenatoprazole, oxidation of sulfides using β-amino alcs. as chiral ligands)

L11 ANSWER 12 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:249669 CAPLUS
DOCUMENT NUMBER: 147:235177
TITLE: Process for preparation of alkali metal or alkaline earth metal salts of an optically active substituted

pyridinylmethyl-sulfinyl-benzimidazole

INVENTOR(S): Muljibhai, Patel Vijay; Ravikant, Soni Rohit; Budhdev, Rehani Rajeev; Rajamannar, Thennati

PATENT ASSIGNEE(S): Sun Pharmaceutical Industries Ltd., India

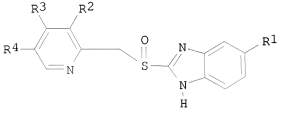
SOURCE: Indian Pat. Appl., 16pp.
CODEN: INXXBQ

DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
IN 2003MU00503	A	20050211	IN 2003-MU503	20030519

PRIORITY APPLN. INFO.: IN 2003-MU503 20030519
OTHER SOURCE(S): CASREACT 147:235177; MARPAT 147:235177

GI



I

AB A process for the preparation of alkali metal or alkaline earth metal salts of an optically active enantiomer or an enantiomerically enriched form of substituted pyridinylmethyl-sulfinyl-benzimidazole. The said process comprises enantioselective catalytic oxidation of a substituted pyridinylmethyl prochiral sulfide derivative of benzimidazole, with an oxidizing agent in an organic solvent in the presence of a base and a catalyst comprising titanium or vanadium complexed with a chiral monodentate ligand to obtain the compound I (R1-R4 = H, linear or branched C1-4 alkyl, alkoxy, aryl, aryloxy, etc.), thereafter treating the compound I with an alkali or alkaline earth metal source.
AB A process for the preparation of alkali metal or alkaline earth metal salts of an optically active enantiomer or an enantiomerically enriched form of substituted pyridinylmethyl-sulfinyl-benzimidazole. The said process comprises enantioselective catalytic oxidation of a substituted pyridinylmethyl prochiral sulfide derivative of benzimidazole, with an oxidizing agent in an organic solvent in the presence of a base and a catalyst comprising titanium or vanadium complexed with a chiral monodentate ligand to obtain the compound I (R1-R4 = H, linear or branched C1-4 alkyl, alkoxy, aryl, aryloxy, etc.), thereafter treating the compound I with an alkali or alkaline earth metal source.

IT 546-68-9, Titanium isopropoxide 20698-91-3 21210-43-5, S-(+)-Methyl mandelate
RL: CAT (Catalyst use); USES (Uses)
(preparation of alkali or alkaline earth metal salts of optically active substituted pyridinylmethyl-sulfinyl-benzimidazole)

IT 7786-30-3, Magnesium dichloride, reactions 73590-85-9, Omeprazole sulfide
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of alkali or alkaline earth metal salts of optically active substituted pyridinylmethyl-sulfinyl-benzimidazole)
IT 161796-78-7P, Esomeprazole sodium
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of alkali or alkaline earth metal salts of optically active substituted pyridinylmethyl-sulfinyl-benzimidazole)

L11 ANSWER 13 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:1090370 CAPLUS
DOCUMENT NUMBER: 145:438615
TITLE: Enantioselective production of benzimidazole derivatives and their salts
INVENTOR(S): Jiang, Biao; Zhao, Xiao-Long; Dong, Jia-Jia; Wang, Wan-Jun
PATENT ASSIGNEE(S): Ratiopharm GmbH, Germany
SOURCE: Ger., 16pp.
CODEN: GWXXAW
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102005061720	B3	20061019	DE 2005-102005061720	20051222
CA 2634138	A1	20070719	CA 2006-2634138	20060419
WO 2007079784	A1	20070719	WO 2006-EP3587	20060419
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
EP 1966188	A1	20080910	EP 2006-742610	20060419
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR				
IN 2008DN04677	A	20080815	IN 2008-DN4677	20080530
CN 101341144	A	20090107	CN 2006-80048005	20080619
US 20080319195	A1	20081225	US 2008-158450	20080620
PRIORITY APPLN. INFO.:			DE 2005-102005061720A	20051222
			WO 2006-EP3587 W	20060419

OTHER SOURCE(S): CASREACT 145:438615; MARPAT 145:438615
GI

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

AB The invention concerns a new procedure for the production of benzimidazole

derivs. I with a chiral sulfoxide group in enantiomerically pure form or in a form, in which one of the two enantiomers is enriched opposite the other enantiomer. The invention concerns likewise a procedure for the production of the salts of the individual enantiomers of the benzimidazole derivs. with a chiral sulfoxide group. In particular the invention concerns a procedure for the production of the S-enantiomer of omeprazol (also known as esomeprazol) and the salts of it, in particular the zinc salt of the S-enantiomer of the omeprazol. The procedure comprises: (a) mix (R,R)- or (S,S)-1,2-bisarylethane-1,2-diols with titanium alkoxide in an organic solvent; (b) add water; (c) add a prochiral sulfide II; (d) add an oxidizing agent; (e) add aqueous ammonia; (f) add an acid; (g) extract with an organic solvent; (h) cool the organic solution and filter; and (i) optionally prepare the zinc salts of I. Thus, (S)-omeprazol (III) was prepared in 94 % yield and >99% enantiomeric excess from 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole (IV) via S-oxidation with Me3COOH in aqueous PhMe containing Ti(OCHMe2)4 and (R,R)-1,2-bis(2-bromophenyl)ethane-1,2-diol.

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB The invention concerns a new procedure for the production of benzimidazole derivs. I with a chiral sulfoxide group in enantiomerically pure form or in a form, in which one of the two enantiomers is enriched opposite the other enantiomer. The invention concerns likewise a procedure for the production of the salts of the individual enantiomers of the benzimidazole derivs. with a chiral sulfoxide group. In particular the invention concerns a procedure for the production of the S-enantiomer of omeprazol (also known as esomeprazol) and the salts of it, in particular the zinc salt of the S-enantiomer of the omeprazol. The procedure comprises: (a) mix (R,R)- or (S,S)-1,2-bisarylethane-1,2-diols with titanium alkoxide in an organic solvent; (b) add water; (c) add a prochiral sulfide II; (d) add an oxidizing agent; (e) add aqueous ammonia; (f) add an acid; (g) extract with an organic solvent; (h) cool the organic solution and filter; and (i) optionally prepare the zinc salts of I. Thus, (S)-omeprazol (III) was prepared in 94 % yield and >99% enantiomeric excess from 5-methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole (IV) via S-oxidation with Me3COOH in aqueous PhMe containing Ti(OCHMe2)4 and (R,R)-1,2-bis(2-bromophenyl)ethane-1,2-diol.

ST omeprazol salt prepn; esomeprazol salt prepn; benzimidazole deriv salt enantioselective synthesis; benzimidazolyl sulfide oxidn hydroperoxide titanium alkoxide chiral bisarylethanediol ligand

IT Ligands
RL: CAT (Catalyst use); USES (Uses)
(chiral, bisarylethanediols; enantioselective synthesis of benzimidazole derivs. and their salts)

IT Glycols, uses
RL: CAT (Catalyst use); USES (Uses)
(chiral, vicinal, ligands; enantioselective synthesis of benzimidazole derivs. and their salts)

IT Metal alkoxides
RL: CAT (Catalyst use); USES (Uses)
(titanium, S-oxidation catalyst; enantioselective synthesis of benzimidazole derivs. and their salts)

IT 546-68-9, Titanium(IV) isopropoxide 7440-32-6D, Titanium, compound
RL: CAT (Catalyst use); USES (Uses)
(S-oxidation catalyst; enantioselective synthesis of benzimidazole derivs.

and their salts)
IT 2325-10-2D, (S,S)-1,2-Diphenylethane-1,2-diol, derivs. 52340-78-0D, derivs. 113424-62-7, (S,S)-1,2-Bis(2-naphthyl)ethane-1,2-diol 113469-20-8 128574-70-9, (S,S)-1,2-Bis(2-bromophenyl)ethane-1,2-diol 159406-53-8 229184-99-0, (S,S)-1,2-Bis(1-naphthyl)ethane-1,2-diol
RL: CAT (Catalyst use); USES (Uses)
(chiral ligand; enantioselective synthesis of benzimidazole derivs. and their salts)
IT 128574-71-0P, (R,R)-1,2-Bis(2-bromophenyl)ethane-1,2-diol
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(chiral ligand; enantioselective synthesis of benzimidazole derivs. and their salts)
IT 73590-85-9, 5-Methoxy-2-[[(4-methoxy-3,5-dimethyl-2-pyridinyl)methyl]thio]-1H-benzimidazole
RL: RCT (Reactant); RACT (Reactant or reagent)
(enantioselective S-oxidation of; enantioselective synthesis of benzimidazole derivs. and their salts)
IT 102625-70-7P 103577-45-3P 117976-89-3P 119141-89-8P, (R)-Esomeprazole 130368-62-6P 136177-53-2P 139644-93-2P 193335-88-5P 565431-48-3P, (S)-Omeprazole zinc salt 912968-18-4P, (±)-Esomeprazole zinc
RL: SPN (Synthetic preparation); PREP (Preparation)
(enantioselective synthesis of benzimidazole derivs. and their salts)
IT 119141-88-7P, (S)-Esomeprazole
RL: PUR (Purification or recovery); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and zinc salt formation of; enantioselective synthesis of benzimidazole derivs. and their salts)
IT 73590-58-6P, (±)-Omeprazole
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and zinc salt formation of; enantioselective synthesis of benzimidazole derivs. and their salts)

L11 ANSWER 14 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:778549 CAPLUS
DOCUMENT NUMBER: 145:249204
TITLE: Process for preparation of (S)-omeprazole by enantioselective oxidation
INVENTOR(S): Jiang, Biao; Zhao, Xiaolong; Wang, Wanjun; Dong, Jiajia; Xu, Xiangya
PATENT ASSIGNEE(S): Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 13pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1810803	A	20060802	CN 2006-10023955	20060217

PRIORITY APPLN. INFO.: CN 2006-10023955 20060217
OTHER SOURCE(S): CASREACT 145:249204; MARPAT 145:249204
AB The title method includes oxidizing 5-methoxy-2-(4-methoxy-3,5-dimethylpyridin-2-ylmethylthio)-1H-benzimidazole with oxidant in the presence of chiral bidentate ligand (R,R)/(S,S)-1,2-diaryl-ethylene glycol and titanium

tetraalkoxide at a molar ratio of 1:(0.5-3):(0.02-0.4):(0.01-0.2) at -78°C to 50°C for 1-24 h; quenching reaction with basic aqueous solution and purifying to obtain neutral free base (S)-omeprazole solid with ee of 92-99%; wherein the chiral bidentate ligand and the titanium tetraalkoxide in-situ form a complex catalyst in the reaction; and the oxidant is a peroxide compound This invention has the advantages of no requirement for costly cumenyl hydroperoxide and diisopropylethylamine, and high yield.

AB The title method includes oxidizing 5-methoxy-2-(4-methoxy-3,5-dimethylpyridin-2-ylmethylthio)-1H-benzimidazole with oxidant in the presence of chiral bidentate ligand (R,R)/(S,S)-1,2-diaryl-ethylene glycol and titanium tetraalkoxide at a molar ratio of 1:(0.5-3):(0.02-0.4):(0.01-0.2) at -78°C to 50°C for 1-24 h; quenching reaction with basic aqueous solution and purifying to obtain neutral free base (S)-omeprazole solid with ee of 92-99%; wherein the chiral bidentate ligand and the titanium tetraalkoxide in-situ form a complex catalyst in the reaction; and the oxidant is a peroxide compound This invention has the advantages of no requirement for costly cumenyl hydroperoxide and diisopropylethylamine, and high yield.

IT 119141-88-7P, (S)-Omeprazole 119141-89-8P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of (S)-omeprazole by enantioselective oxidation)

IT 75-91-2, tert-Butyl hydrogen peroxide 7722-84-1, Hydrogen peroxide, reactions 73590-85-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of (S)-omeprazole by enantioselective oxidation)

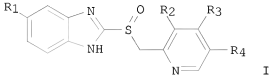
L11 ANSWER 15 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:365469 CAPLUS
DOCUMENT NUMBER: 144:390922
TITLE: Stereoselective oxidation processes for the preparation of chiral substituted sulfoxides from the racemic sulfides
INVENTOR(S): Kumar, Neela Praveen; Khanna, Mahavir Singh; Prasad, Mohan; Kumar, Yatendra
PATENT ASSIGNEE(S): Ranbaxy Laboratories Limited, India
SOURCE: PCT Int. Appl., 23 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2006040635	A1	20060420	WO 2005-IB2946	20051004

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

EP 1802584 A1 20070704 EP 2005-790107 20051004
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR
IN 2007DN03340 A 20070831 IN 2007-DN3340 20070503
US 20080275245 A1 20081106 US 2008-576867 20080220
PRIORITY APPLN. INFO.: IN 2004-DE1957 A 20041011
WO 2005-IB2946 W 20051004
OTHER SOURCE(S): CASREACT 144:390922; MARPAT 144:390922
GI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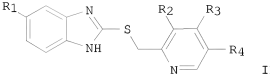

II

AB An enantioselective catalytic oxidation process for the preparation of an optically active enantiomer or an enantiomerically enriched form of a substituted pyridinylmethylsulfinylbenzimidazole [I; R1-R4 = H, C1-4 (un)branched alkyl, C1-4 (un)branched alkoxy, aryl, aryloxy], or its pharmaceutically acceptable salts (e.g., esomeprazole potassium), comprises oxidizing a prochiral sulfide (II; e.g., omeprazole sulfide) in the presence of a chiral transition metal complex [e.g., titanium isopropoxide and L-(+)-diethyl tartrate] and a base (e.g., diisopropylethylamine) in the absence of an organic solvent with an oxidant (e.g., cumene hydroperoxide) followed by an optional salification (e.g., potassium hydroxide).
OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
TI Stereoselective oxidation processes for the preparation of chiral substituted sulfoxides from the racemic sulfides
AB An enantioselective catalytic oxidation process for the preparation of an optically active enantiomer or an enantiomerically enriched form of a substituted pyridinylmethylsulfinylbenzimidazole [I; R1-R4 = H, C1-4 (un)branched alkyl, C1-4 (un)branched alkoxy, aryl, aryloxy], or its pharmaceutically acceptable salts (e.g., esomeprazole potassium), comprises oxidizing a prochiral sulfide (II; e.g., omeprazole sulfide) in the presence of a chiral transition metal complex [e.g., titanium isopropoxide and L-(+)-diethyl tartrate] and a base (e.g., diisopropylethylamine) in the absence of an organic solvent with an oxidant (e.g., cumene hydroperoxide) followed by an optional salification (e.g., potassium hydroxide).
IT Sulfoxides
RL: SPN (Synthetic preparation); PREP (Preparation)
(aryl, chiral; stereoselective oxidation processes for the

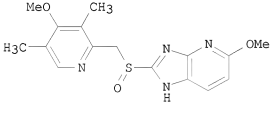
preparation of chiral substituted sulfoxides)
IT Thioethers
RL: RCT (Reactant); RACT (Reactant or reagent)
(aryl, racemic; stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT Glycols, uses
RL: CAT (Catalyst use); USES (Uses)
(chiral; stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT Hydroperoxides
Peroxides, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(organic; stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT Oxidizing agents
Stereochemistry
(stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT Alkali metal hydroxides
Bicarbonates
Carbonates, reactions
Sulfates, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT Oxidation
(stereoselective; stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT Aromatic compounds
RL: SPN (Synthetic preparation); PREP (Preparation)
(sulfoxides, chiral; stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT 75-50-3, Trimethylamine, reactions 102-82-9, Tributylamine 110-86-1, Pyridine, reactions 110-91-8, Morpholine, reactions 121-44-8, Triethylamine, reactions 1122-58-3, 4-(Dimethylamino)pyridine 3001-72-7, DBN 3424-21-3, Triisopropylamine 6674-22-2, DBU 7087-68-5, Diisopropylethylamine
RL: RGT (Reagent); RACT (Reactant or reagent)
(base; stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT 87-91-2, Diethyl L-tartrate 546-68-9, Titanium isopropoxide 7440-32-6, Titanium, uses 7440-62-2, Vanadium, uses 7440-67-7, Zirconium, uses 13811-71-7, Diethyl D-tartrate
RL: CAT (Catalyst use); USES (Uses)
(stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT 80-15-9, Cumene hydroperoxide 1310-58-3, Potassium hydroxide, reactions 7487-88-9, Magnesium sulfate, reactions 7722-84-1, Hydrogen peroxide, reactions 17194-00-2, Barium hydroxide 73590-85-9, Omeprazole sulfide
RL: RCT (Reactant); RACT (Reactant or reagent)
(stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT 793668-06-1P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)
IT 161796-81-2P 161796-84-5P 161973-10-0P, Esomeprazole magnesium

RL: SPN (Synthetic preparation); PREP (Preparation)
(stereoselective oxidation processes for the preparation of chiral substituted sulfoxides)

L11 ANSWER 16 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:227058 CAPLUS
DOCUMENT NUMBER: 142:430268
TITLE: Preparation of (S)- and (R)-enantiomers of tenatoprazole as H+/K+ ATPase inhibitors
INVENTOR(S): Li, Shuxin; Zhao, Yanjin; Guo, Jinhua
PATENT ASSIGNEE(S): Institute of Radiomedicine, Academy of Military Medical Science of PLA, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 9 pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1453278	A	20031105	CN 2002-117637	20020510
PRIORITY APPLN. INFO.:			CN 2002-117289 A	20020423

OTHER SOURCE(S): CASREACT 142:430268
GI



I

AB The invention is related to (S)- and (R)-enantiomers of tenatoprazole I and pharmaceutically acceptable salts thereof, their preparation and uses. (S)-I was synthesized by enantioselective oxidation of the corresponding sulfide with dicumyl peroxide in the presence of (i-PrO)4Ti and D-tartaric acid di-Et ester in 71.5% yield. (R)-I was obtained via oxidation of the corresponding sulfide with m-chloroperbenzoic acid followed by chiral HPLC resolution (37.5% yield). The two enantiomers showed stronger activity than omeprazole and comparable activity to tenatoprazole both in an inhibition assay against H+/K+ ATPase and in a gastric acid secretion-inhibition test in rat. Therefore, the invented compds. are useful for the treatment of gastric acid secretion disorders.

OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)

AB The invention is related to (S)- and (R)-enantiomers of tenatoprazole I and pharmaceutically acceptable salts thereof, their preparation and uses. (S)-I was synthesized by enantioselective oxidation of the corresponding sulfide with dicumyl peroxide in the presence of (i-PrO)4Ti and D-tartaric acid di-Et ester in 71.5% yield. (R)-I was obtained via oxidation of the corresponding sulfide with m-chloroperbenzoic acid followed by chiral HPLC resolution (37.5% yield). The two enantiomers showed stronger activity than omeprazole and comparable activity to tenatoprazole

both in an inhibition assay against H+/K+ ATPase and in a gastric acid secretion-inhibition test in rat. Therefore, the invented compds. are useful for the treatment of gastric acid secretion disorders.

IT 546-68-9, Tetra(isopropoxy)titanium 13811-71-7, D-Tartaric acid diethyl ester
RL: CAT (Catalyst use); USES (Uses)
(preparation of (S)- and (R)-enantiomers of tenatoprazole as H+/K+ ATPase inhibitors)

IT 73590-58-6, Omeprazole
RL: PAC (Pharmacological activity); BIOL (Biological study)
(reference; preparation of (S)- and (R)-enantiomers of tenatoprazole as H+/K+
ATPase inhibitors)

L11 ANSWER 17 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:809813 CAPLUS
DOCUMENT NUMBER: 143:28376
TITLE: An innovative asymmetric sulfide oxidation: The process development history behind the new antiulcer agent esomeprazole
AUTHOR(S): Federsel, Hans-Juergen; Larsson, Magnus
CORPORATE SOURCE: Process R&D, Astra Zeneca, Soedertalje, S-15185, Swed.
SOURCE: Asymmetric Catalysis on Industrial Scale (2004), 413-436. Editor(s): Blaser, Hans-Ulrich; Schmidt, Elke. Wiley-VCH Verlag GmbH & Co. KGaA: Weinheim, Germany.
CODEN: 69FWZH; ISBN: 3-527-30631-5
DOCUMENT TYPE: Conference; General Review
LANGUAGE: English

AB A review. The proton pump inhibitor Losec/Prilosec, which uses the racemic sulfoxide omeprazole as the active ingredient, has been an extraordinary success story ever since the first introduction into the market in 1988. However, there was room for improvement with respect to its clin. profile, for example to reduce inter-patient variation by increasing the bioavailability and this led, after conducting a thorough screening investigation, to the identification of the (S)-enantiomer of omeprazole as a compound fulfilling these goals. In order to conduct more comprehensive studies on the properties of this mol., later to be named esomeprazole, larger quantities of material were needed and so the first attempt was to sep. the stereoisomers in omeprazole using preparative chromatog. Albeit this approach was rather labor intensive, it afforded the required amts. of several hundred grams of each enantiomer in satisfactory purity. For further scale-up this methodol. had some clear drawbacks so the focus was aimed at developing an asym. synthesis. When applying the procedure reported by Kagan using titanium as the catalyst together with a chiral auxiliary, such as tartaric acid esters, in the presence of H2O to our prochiral sulfide pyrmetazole, the outcome was disappointing as the isolated product had an optical purity of only 5% ee. Nonetheless our endeavors continued and, very unexpectedly, we found that by adding a base such as diisopropylethylamine to the reaction mixture the ee increased immediately to around 60%. Further work resulted in a full-scale catalytic process transferred into com. production operating on the multi-ton volume per annum and providing the desired esomeprazole product in chemical as well as optical yields well above 90%. A review on the details behind this achievement, starting with the background and proceeding via the earliest attempts onto the details of how the work in the area of enantioselective catalysis was conducted and its further progress to the final unique method of manufacture

OS.CITING REF COUNT: 14 THERE ARE 14 CAPLUS RECORDS THAT CITE THIS RECORD (14 CITINGS)

REFERENCE COUNT: 58 THERE ARE 58 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB A review. The proton pump inhibitor Losec/Prilosec, which uses the racemic sulfoxide omeprazole as the active ingredient, has been an extraordinary success story ever since the first introduction into the market in 1988. However, there was room for improvement with respect to its clin. profile, for example to reduce inter-patient variation by increasing the bioavailability and this led, after conducting a thorough screening investigation, to the identification of the (S)-enantiomer of omeprazole as a compound fulfilling these goals. In order to conduct more comprehensive studies on the properties of this mol., later to be named esomeprazole, larger quantities of material were needed and so the first attempt was to sep. the stereoisomers in omeprazole using preparative chromatog. Albeit this approach was rather labor intensive, it afforded the required amts. of several hundred grams of each enantiomer in satisfactory purity. For further scale-up this methodol. had some clear drawbacks so the focus was aimed at developing an asym. synthesis. When applying the procedure reported by Kagan using titanium as the catalyst together with a chiral auxiliary, such as tartaric acid esters, in the presence of H2O to our prochiral sulfide pyrmetazole, the outcome was disappointing as the isolated product had an optical purity of only 5% ee. Nonetheless our endeavors continued and, very unexpectedly, we found that by adding a base such as diisopropylethylamine to the reaction mixture the ee increased immediately to around 60%. Further work resulted in a full-scale catalytic process transferred into com. production operating on the multi-ton volume per annum and providing the desired esomeprazole product in chemical as well as optical yields well above 90%. A review on the details behind this achievement, starting with the background and proceeding via the earliest attempts onto the details of how the work in the area of enantioselective catalysis was conducted and its further progress to the final unique method of manufacture

IT 119141-88-7, Esomeprazole
RL: BCP (Biochemical process); BUU (Biological use, unclassified); BIOL (Biological study); PROC (Process); USES (Uses)
(process development history behind new antiulcer agent esomeprazole in asym. sulfide oxidation)

L11 ANSWER 18 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:20682 CAPLUS
DOCUMENT NUMBER: 140:77151
TITLE: process for preparation of optically pure or optically enriched sulfoxides, including amorphous esomeprazole and salts thereof, via resolution using transition metal complexes.
INVENTOR(S): Reddy, Manne Satyanarayana; Kumar, Muppa Kishore; Reddy, Kikkuru Srirami; Purandhar, Koilkonda; Sreenath, Keshaboina
PATENT ASSIGNEE(S): Reddy's Laboratories Limited, India; Reddy's Laboratories, Inc.
SOURCE: PCT Int. Appl., 35 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004002982	A2	20040108	WO 2003-US20250	20030627
WO 2004002982	A3	20040610		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

IN	2002MA00489	A	20070622	IN 2002-MA489	20020627
CA	2491118	A1	20040108	CA 2003-2491118	20030627
AU	2003247729	A1	20040119	AU 2003-247729	20030627
US	20040077869	A1	20040422	US 2003-608781	20030627
US	7169793	B2	20070130		
EP	1515963	A2	20050323	EP 2003-762106	20030627
EP	1515963	B1	20070214		

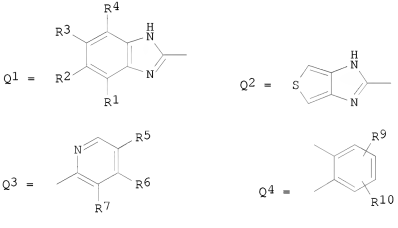
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

CN	1665805	A	20050907	CN 2003-815152	20030627
CN	100378093	C	20080402		
AT	353887	T	20070315	AT 2003-762106	20030627

PRIORITY APPLN. INFO.:	IN 2002-MA489	A	20020627
	IN 2002-MA493	A	20020628
	WO 2003-US20250	W	20030627

OTHER SOURCE(S): MARPAT 140:77151

GI



AB Title process comprises (a) providing, in an organic solvent, a mixture of optical isomers of R'SOXR'' [R' = Q1, Q2; R'' = Q3; X = CHR8, Q4; R1-R4 = H, alkyl, alkoxy, halo, haloalkoxy, alkylcarbonyl, alkoxycarbonyl, oxazolyl, trifluoroalkyl; R5-R7 = H, alkyl, haloalkyl, alkylthio, haloalkylthio, alkoxy, haloalkoxy, alkoxyalkoxy, dialkylamino, piperdino, morpholino, halo, phenylalkyl, phenylalkoxy; R8 = H, alkyl; R9, R10 = H, halo, alkyl, alkoxy] (b) reacting the mixture with a coordinating agent containing a transition metal and a chelating agent to form a mixture of transition metal complexes at the sulfoxide group; (c) reacting the mixture of transition metal complexes with an organic acid (salt), which is capable of forming an addition product with the transition metal complex, wherein

≥1 of the chelating agent or the organic acid contains a chiral center and is substantially enantiomerically pure; thereby each of the transition metal complexes of the optical isomers forms an adduct with the organic acid or a salt thereof, the different adducts having ≥1 phys. property in which they differ from one another; (d) separating 1 of the adducts from the other based on ≥1 different phys. property; treating the separated adduct with an acid or base to decompose the complex thereby obtaining a product that is one of the optical isomers of the sulfoxide compound in a substantially optically pure or optically enriched form. Thus, omeprazole sodium (preparation given) in acetone was treated sequentially at 35-40° with di-Et D-tartrate, titanium tetraisopropoxide, Et3N, and L-mandelic acid followed by stirring to precipitate the L-mandelic acid titanium complex salt of esomeprazole in 99.78% chiral purity. This was suspended in CH2Cl2/aqueous NaHCO3 followed by stirring, separation of the CH2Cl2 layer, and evaporation to give esomeprazole in 99.85% chiral purity.

OS.CITING REF COUNT: 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS RECORD (7 CITINGS)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AB Title process comprises (a) providing, in an organic solvent, a mixture of optical isomers of R'SOXR'' [R' = Q1, Q2; R'' = Q3; X = CHR8, Q4; R1-R4 = H, alkyl, alkoxy, halo, haloalkoxy, alkylcarbonyl, alkoxycarbonyl, oxazolyl, trifluoroalkyl; R5-R7 = H, alkyl, haloalkyl, alkylthio, haloalkylthio, alkoxy, haloalkoxy, alkoxyalkoxy, dialkylamino, piperdino, morpholino, halo, phenylalkyl, phenylalkoxy; R8 = H, alkyl; R9, R10 = H, halo, alkyl, alkoxy] (b) reacting the mixture with a coordinating agent containing a transition metal and a chelating agent to form a mixture of transition metal complexes at the sulfoxide group; (c) reacting the mixture of transition metal complexes with an organic acid (salt), which is capable of forming an addition product with the transition metal complex, wherein ≥1 of the chelating agent or the organic acid contains a chiral center and is substantially enantiomerically pure; thereby each of the transition metal complexes of the optical isomers forms an adduct with the organic acid or a salt thereof, the different adducts having ≥1 phys. property in which they differ from one another; (d) separating 1 of the adducts from the other based on ≥1 different phys. property; treating the separated adduct with an acid or base to decompose the complex thereby obtaining a product that is one of the optical isomers of the sulfoxide compound in a substantially optically pure or optically enriched form. Thus, omeprazole sodium (preparation given) in acetone was treated sequentially at 35-40° with di-Et D-tartrate, titanium tetraisopropoxide, Et3N, and L-mandelic acid followed by stirring to precipitate the L-mandelic acid titanium complex salt of esomeprazole in 99.78% chiral purity. This was suspended in CH2Cl2/aqueous NaHCO3 followed by stirring, separation of the CH2Cl2 layer, and evaporation to give esomeprazole in 99.85% chiral purity.

IT 7439-95-4DP, Magnesium, Esomeprazole complex 119141-88-7P, Esomeprazole 119141-89-8P 161796-78-7P 161796-84-5P
RL: IMF (Industrial manufacture); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(process for preparation of optically pure or optically enriched sulfoxides, including amorphous esomeprazole and salts thereof, via resolution using transition metal complexes)

IT 611-71-2DP, D-Mandelic acid, Omeprazole-Titanium complex
7440-32-6DP, Titanium, Esomeprazole and Omeprazole complexes
17199-29-0DP, L-Mandelic acid, Esomeprazole-Titanium complex
119141-88-7DP, Esomeprazole, Titanium and Magnesium complexes 119141-89-8DP, (+)-Omeprazole, Titanium

complex
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(process for preparation of optically pure or optically enriched sulfoxides, including amorphous esomeprazole and salts thereof, via resolution using transition metal complexes)

IT 73590-58-6, Omeprazole
RL: RCT (Reactant); RACT (Reactant or reagent)
(process for preparation of optically pure or optically enriched sulfoxides, including amorphous esomeprazole and salts thereof, via resolution using transition metal complexes)

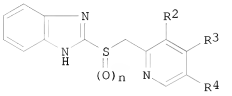
IT 95510-70-6P, Omeprazole sodium
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(process for preparation of optically pure or optically enriched sulfoxides, including amorphous esomeprazole and salts thereof, via resolution using transition metal complexes)

IT 87-91-2, Diethyl L-tartrate 121-44-8, Triethylamine, reactions 497-19-8, Sodium carbonate, reactions 546-68-9, Titanium tetraisopropoxide 611-71-2, D-Mandelic acid 1310-58-3, Potassium hydroxide, reactions 1310-73-2, Sodium hydroxide, reactions 7087-68-5, Diisopropylethylamine 7439-95-4, Magnesium, reactions 13811-71-7, Diethyl D-tartrate 17199-29-0, L-Mandelic acid
RL: RGT (Reagent); RACT (Reactant or reagent)
(process for preparation of optically pure or optically enriched sulfoxides, including amorphous esomeprazole and salts thereof, via resolution using transition metal complexes)

L11 ANSWER 19 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:855907 CAPLUS
DOCUMENT NUMBER: 139:350735
TITLE: Preparation of optically active substituted pyridinylmethylsulfinylbenzimidazoles and salts
INVENTOR(S): Thennati, Rajamannar; Rehani, Rajeev Budhdev; Soni, Rohit Ravikant; Chhabada, Vijay Chhangamal; Patel, Vijaykumar Muljibhai
PATENT ASSIGNEE(S): Sun Pharmaceutical Industries Limited, India
SOURCE: PCT Int. Appl., 31 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003089408	A2	20031030	WO 2003-IN164	20030421
WO 2003089408	A3	20040205		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
IN 194216	A1	20041002	IN 2002-MU299	20020422
IN 2002MU00365	A	20050304	IN 2002-MU365	20020422

AU 2003262375 A1 20031103 AU 2003-262375 20030421
PRIORITY APPLN. INFO.: IN 2002-MU299 A 20020422
IN 2002-MU365 A 20020422
WO 2003-IN164 W 20030421
OTHER SOURCE(S): CASREACT 139:350735; MARPAT 139:350735
GI



I

AB Optically active enantiomers of the title compds. I [R1-R4 = H, (un)substituted alkyl, alkoxy, aryl, aryloxy; n = 1] are prepared by stereoselective oxidation of I [n = 0] with an oxidizing agent in an organic solvent in the presence of a base and a catalyst comprising titanium or vanadium complexed with a chiral monodentate ligand. The process yields alkali or alkaline earth metal salts of 5-methoxy-2-[(S)-(4-methoxy-3,5-dimethyl-2-pyridinylmethyl)sulfinyl]-1H-benzimidazole substantially free of sulfone impurity, optionally after purification in a ketone or nitrile solvent. Thus, omeprazole sulfide is oxidized with cumene hydroperoxide in presence of EtN(CHMe2)2, Me (S)-(+)-mandelate, and Ti(OCHMe2)4 in PhMe, followed by washing with MeCN to give esomeprazole sodium with >985 ee.
OS.CITING REF COUNT: 11 THERE ARE 11 CAPLUS RECORDS THAT CITE THIS RECORD (11 CITINGS)
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
AB Optically active enantiomers of the title compds. I [R1-R4 = H, (un)substituted alkyl, alkoxy, aryl, aryloxy; n = 1] are prepared by stereoselective oxidation of I [n = 0] with an oxidizing agent in an organic solvent in the presence of a base and a catalyst comprising titanium or vanadium complexed with a chiral monodentate ligand. The process yields alkali or alkaline earth metal salts of 5-methoxy-2-[(S)-(4-methoxy-3,5-dimethyl-2-pyridinylmethyl)sulfinyl]-1H-benzimidazole substantially free of sulfone impurity, optionally after purification in a ketone or nitrile solvent. Thus, omeprazole sulfide is oxidized with cumene hydroperoxide in presence of EtN(CHMe2)2, Me (S)-(+)-mandelate, and Ti(OCHMe2)4 in PhMe, followed by washing with MeCN to give esomeprazole sodium with >985 ee.
IT 546-68-9, Titanium isopropoxide 20698-91-3, Methyl (R)-(-)-mandelate 21210-43-5, Methyl (S)-(+)-mandelate
RL: CAT (Catalyst use); USES (Uses)
(preparation of optically active substituted pyridinylmethylsulfinylbenzimidazoles and salts)
IT 161796-78-7P, Esomeprazole sodium
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of optically active substituted pyridinylmethylsulfinylbenzimidazoles and salts)
IT 73590-85-9, Omeprazole sulfide
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of optically active substituted pyridinylmethylsulfinylbenzimidazoles and salts)

L11 ANSWER 20 OF 20 CAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 1996:353180 CAPLUS
DOCUMENT NUMBER: 125:58516
ORIGINAL REFERENCE NO.: 125:11253a,11256a
TITLE: Preparation of unsymmetrical heterocyclylsulfoxide enantiomers
INVENTOR(S): Larsson, Erik Magnus; Stenhede, Urban Jan; Soerensen, Henrik; Von Unge, Per Oskar Sverker; Cotton, Hanna Kristina
PATENT ASSIGNEE(S): Astra Aktiebolag, Swed.
SOURCE: PCT Int. Appl., 67 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9602535	A1	19960201	WO 1995-SE818	19950703
W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT				
RW: KE, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
SE 9402510	A	19960116	SE 1994-2510	19940715
SE 504459	C2	19970217		
JP 10504290	T	19980428	JP 1996-504938	19950703
JP 3795917	B2	20060712		
RU 2157806	C2	20001020	RU 1997-102162	19950703
EE 3354	B1	20010215	EE 1997-6	19950703
AT 242233	T	20030615	AT 1995-926068	19950703
ES 2199998	T3	20040301	ES 1995-926068	19950703
SK 284059	B6	20040908	SK 1997-48	19950703
CA 2193994	A1	19960201	CA 1995-2193994	19950705
CA 2193994	C	20050503		
AU 9529948	A	19960216	AU 1995-29948	19950705
AU 688074	B2	19980305		
EP 773940	A1	19970521	EP 1995-926068	19950705
EP 773940	B1	20030604		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
CN 1157614	A	19970820	CN 1995-194956	19950705
CN 1070489	C	20010905		
HU 76642	A2	19971028	HU 1997-108	19950705
HU 226361	B1	20080929		
BR 9508292	A	19971223	BR 1995-8292	19950705
PL 186342	B1	20031231	PL 1995-318165	19950705
IN 1995DE01255	A	20050701	IN 1995-DE1255	19950705
CZ 297987	B6	20070516	CZ 1997-64	19950705
IL 114477	A	20010724	IL 1995-114477	19950706
ZA 9505724	A	19960115	ZA 1995-5724	19950710
HR 9500401	B1	20040430	HR 1995-401	19950712
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HK 1008331 A1 20031121 HK 1998-109230 19980717
PRIORITY APPLN. INFO.: SE 1994-2510 A 19940715
WO 1995-SE818 W 19950703
OTHER SOURCE(S): CASREACT 125:58516; MARPAT 125:58516
AB Enantiomeric R1ZSOR2 [R1 = (un)substituted 2-pyridyl, (un)substituted 2-(R4R5N)C6H4; R2 = (un)substituted 2-benzimidazolyl, thieno[3,4-d]imidazol-2-yl, etc.; R4,R5 = H, (ar)alkyl; Z = CH2, (un)substituted 1,2-phenylene, etc.] were prepared by oxidation of prochiral R1ZSR2 in the presence of a chiral Ti complex and a base.
OS.CITING REF COUNT: 37 THERE ARE 37 CAPLUS RECORDS THAT CITE THIS RECORD (82 CITINGS)
REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT
AB Enantiomeric R1ZSOR2 [R1 = (un)substituted 2-pyridyl, (un)substituted 2-(R4R5N)C6H4; R2 = (un)substituted 2-benzimidazolyl, thieno[3,4-d]imidazol-2-yl, etc.; R4,R5 = H, (ar)alkyl; Z = CH2, (un)substituted 1,2-phenylene, etc.] were prepared by oxidation of prochiral R1ZSR2 in the presence of a chiral Ti complex and a base.
IT 546-68-9, Titanium isopropoxide
RL: CAT (Catalyst use); USES (Uses)
(preparation of unsym. heterocyclylsulfoxide enantiomers)
IT 119141-88-7P 119141-89-8P 138530-94-6P
138530-95-7P 142678-35-1P 142706-18-1P 154461-48-0P 156601-78-4P
156601-79-5P 161796-77-6P 161796-78-7P
170431-13-7P 170431-14-8P 175078-93-0P 177540-99-7P 177541-00-3P
177541-01-4P 177795-59-4P 177795-60-7P 177932-96-6P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of unsym. heterocyclylsulfoxide enantiomers)

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